

PEACE VALUE-ADDED WOOD ASSOCIATION

WOOD KILN
FEASIBILITY STUDY

MARCH 1998

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EXECUTIVE SUMMARY

PURPOSE OF STUDY

In May 1996, representatives from Forest Renewal BC (FRBC) held an information meeting on the Value-added Program in Dawson Creek. Over 40 people from the Peace Region attended the meeting, indicating the high level of interest in further developing the region's value-added sector. Based upon the results of the meeting, the Peace Value-added Wood Association was formed.

One of the first actions of the Association was to approach FRBC to obtain funding for a value-added needs assessment for the Peace Region. The value-added needs assessment concluded that:

“Undoubtedly, the primary need in the region is the establishment of a kiln drier capable of drying wood to a moisture level suitable for the value-added industry and available to that industry on a custom or cooperative basis. The lack of adequate drying space and quality is constraining a number of businesses to the point where they are operating significantly under capacity and failing to meet demand.”

The purpose of this project is to:

- ◆ Assess the feasibility of establishing a kiln operation in the Peace;
- ◆ Review the potential economic impact of the kiln operation in terms of promoting development of a local value-added industry.

Assuming that the decision is made to proceed, a business plan and implementation strategy will then be prepared.

METHOD OF STUDY

We first met with representatives of the Peace Value-added Wood Association to clarify the objectives of the study and the intended outputs. We then undertook an extensive research program which included:

- Interviews with 28 members of the Peace Value-added Wood Association.
- A survey of other potential users of the custom drying facility.
- A review of over 100 studies and other materials relevant to the study.
- A survey of 15 custom kiln operators in B.C. and interviews with representatives of the various kiln associations in BC;
- Interviews with a sample of 60 companies involved in value-added activities, including sawmills, manufacturers, brokers, distributors and other selected experts in Canada and the U.S.;
- Development of capital and operating cost estimates for the proposed kiln operations. In order to develop the capital and operating cost estimates, we obtained capital cost quotes from 15 kiln suppliers and other equipment suppliers. In addition, we obtain input from our technical resource team which included Dave Wilson of Kelfor Industries and Andre Froulette, President of the Northern BC and Alberta Kiln Drying Association as well as others;

and

- Assessed the potential economic impact of the proposed kiln operation.

FEASIBILITY OF THE PROPOSED KILN

The majors findings of our review with respect to the feasibility of the proposed kiln operation are as follows:

1. The potential volumes that could be dried by a custom kiln operation in the Peace are significant.

The strongest commitment for volumes to be put through the kiln in the first year is from **Abeda Wood Products**. Abeda expects that they could annually put through 3 million to 6 million board feet of lumber, consisting primarily of lodgepole pine. Abeda is a wall paneling manufacturer, based in Winfield, that has a Section 21 licence (scheduled to expire in January 2000) under the Small Business Forest Enhancement Program to harvest timber in the Fort St. John area. The company fully expects to obtain additional licenses in the Fort St. John area in the future. If a local kiln is established, the company indicated that it will seriously consider expanding its local presence by establishing a value-added operation in the Fort St. John area.

Based upon their existing production, it is expected that **existing value-added producers** would put through 80,000 to 100,000 board feet in the first year. The existing producers expect that their volumes will increase sharply to 400,000 to 500,000 board feet a year within a relatively short time after the kiln is built.

As evidenced by the strong interest in the Association, it is expected that a custom kiln operation would draw **new operators** into the value-added industry. However, because they do not have existing operations, these individuals can only provide soft commitments at this time to utilize the facility. Some **other companies** also indicated that there is potential for them to put significant volumes through a custom kiln operation as listed below:

- Representatives of Emporium Investment Limited indicated that, if the facility was based in Fort St. John, they may be interested in putting through substantial volumes (perhaps up to 5 million board feet) through a custom kiln operation;
- Ted Coe is a broker who moves about 5 million board feet annually and would be interested in a custom kiln operation;
- Manning Forest Products processes aspen in Northern Alberta and transports it green to various markets, including some value-added processors in BC. The company may be interested in drying volumes which are transported to the BC market;
- Clearco is a remanufacturer based in Alberta that has their own drying facility but may be interested in custom drying during periods when their facility is operating at capacity.

Our interviews indicate that the potential volumes that could be put through a custom kiln operation in the Peace could range from 5 million to 10 million board feet per year.

2. The primary limitation on the size of the facility is likely not the potential volumes that could be put through but rather the availability of capital and the ability of potential customers to commit to specific

volumes.

Based on discussions with Abeda and Association members, it was decided that we would develop capital and operating costs estimates based on a facility that includes:

- a 40,000 to 50,000 board foot kiln; and
- a 20,000 board foot kiln.

The rationale for this configuration includes:

- It will enable the facility to cater to the requirements of one large value-added user who will put through fairly standardized pieces of lumber, and many small users who will put through more variable pieces of lumber in terms of species, moisture content, thicknesses and lengths;
- The capital costs and working capital requirements will be less than \$800,000; and
- It is consistent with truck load volumes.

It is anticipated that the facility would increase in size as the operation becomes more established and as the local industry develops.

3. The capital costs to build the kiln facility are estimated at \$750,000.

Major costs include the price of the kilns and preheat capabilities, installation, the cost of developing a dry storage area, site paving, the cost of a boiler, and land. In order to limit the capital costs, we have proposed:

- Utilizing a well established, relative inexpensive technology;
- Using a side loading kilns, rather than a track loading kiln, because they are less expensive and because load/unload times are not a major issue because of the small size of the kilns.
- Manual rather than automated stickering and destickering.

4. If the facility operated at 80% capacity over the course of the year, it would have to charge about \$100 per thousand board feet for a five day load or \$240 per thousand board feet for a 15 day load in order to cover variable and fixed costs and provide a return on capital.

The price charged by the proposed kiln operation would have to sufficient to:

- Cover the per charge costs and the kiln time costs;
- Contribute towards the fixed overhead costs; and
- Provide a return on capital, which could be used in part to pay for financing charges. In projecting prices, we have assumed that the facility would have to generate a return on capital equal to 15% of the capital costs or \$112,500.

The price will vary depending upon the amount of time that the wood is in the kiln, which itself is a function of the moisture content when the wood enters the kiln and the target moisture content. It will

also vary depending upon capacity utilization; if capacity utilization is low, the markup on per charge and kiln time costs has to be higher in order to cover the fixed overhead costs. Table I compares the average price that would have to be charged by the kiln for various time periods and different capacity utilization rates.

If there were no capital financing costs and no return on capital expected, the operation could break even on prices that are 25% to 60% below those outlined in Table I. The percentage savings increase with the time in kiln and decrease with the capacity utilization.

5. The facility is likely best located in the Fort St. John area, given that both major potential customers (Abeda and Emporium) as well as two of the leading value-added manufacturers expressed a strong preference for this location.

It may be possible to complement this facility by establishing one or more small kilns in other areas of the region. The factors that should be considered in the selection of the kiln location are:

- The site must have access to gas and utility lines as well as highway and possibly rail access;
- It should be located close to a facility with whom it can share employees. Operation of the kiln itself is not a full-time job. Most custom kiln operations provide a range of services. To effectively minimize labour costs in the absence of other services, it would be useful to co-locate the kiln with another operation that could use these workers and perhaps could share equipment such as a forklift;
- The location should be consistent with the needs of the major customers; and
- Land should be available at the site to support future expansion.

6. Potential options for funding may include Human Resources Development Canada, equity contributions and debt funding.

FRBC does not currently have a grant or low/no interest loan program. It has been argued that, if government really wants to support the development of the value-added sector (especially in areas such as the Peace), it will have to get involved in infrastructure development through a vehicle such as a lease to own program, a community initiatives program, a capital grant or repayable grant program, or government-owned facilities. The wood kiln would appear to be an ideal infrastructure project in that it could be a cooperative venture that would benefit a wide range of users. However, while the Association should continue to encourage FRBC to develop such a program, it appears that the business plan will not be able to rely on this as a source of funding.

There may be funding available under the HRDC Transitional Job Fund. The Transitional Jobs Fund (TJF) is a three year initiative designed to support job creation activities in high unemployment areas of the country. Under the program, financial assistance may be obtained to cover wages, employment related costs, administrative costs, overhead, and capital costs.

In the absence of government financing, the kiln would have to be established through a mixture of equity and debt financing from a financial institution. FRBC has two programs to assist small businesses in the forest sector obtain debt financing. However, the interest costs are likely to be less under a mixture of a mortgage, a Small Business Loan Agreement insured loan, and an operating loan from a bank.

7. **To be bankable, the custom kiln operation will likely require confirmed contracts and an equity contribution of at least 25% of the total cost.**

The willingness and capacity to provide equity contributions varies across the Association membership. Many of the members will need whatever capital they have available to gear up to take advantage of the opportunities created by the kiln.

OPPORTUNITIES AND CONSTRAINTS ASSOCIATED WITH THE VALUE-ADDED SECTOR

This section summarizes the major findings of our research regarding the opportunities and constraints associated with developing a value-added sector in the Peace.

1. The value-added wood industry in the Peace Region is in an early stage of development.

Eight of the Peace Value-added Wood Association members are currently producing value-added products in the region. Most of these companies have been established in the past five or six years. Based upon the results of our interviews, we estimate that these companies are generating about \$500,000 in revenues annually from the sale of the value-added products they produce (excluding sawmilling services).

2. Fibre is available to support a much larger value-added industry in the Peace.

There is an opportunity to direct a greater proportion of the softwood resource, currently used for dimensional lumber, towards higher value applications. More importantly, the region has a major hardwood resource that is currently underutilized. For example, the 1996 deciduous harvest represented only 21% of the 1997 AAC in the Fort St. John Forest District and 36% of the AAC in the Dawson Creek Forest District. Most of the hardwood resource currently utilized is used for low value applications.

3. The Peace has the opportunity to follow the pattern of development established in other jurisdictions.

Our research indicates that value-added industries based upon aspen tend to follow a fairly predictable pattern of development. Aspen at first is considered a weed. Then, as other wood resources become more scarce and their prices start to rise, utilizing aspen becomes a consideration. Typically this spark of interest in the plentiful aspen reserves is kindled by government programs that inject funds for research and market development schemes.

Once a level of interest is established, companies begin to create value-added products out of the aspen. Usually the first kind of operations established to harvest the aspen are the large users such as Louisiana Pacific. These types of operations do not differentiate as to the quality of the aspen; instead, aspen is processed as a plentiful low cost input for plywood, OSB, pulp or chip products. Once these companies are fully entrenched, others start contemplating higher value-added aspen products.

The next entrant into the aspen utilization schemes are pallet, crate and box producers. This kind of operation, such as Sunchild in Alberta, also require substantial amounts of aspen; however, now the aspen is being differentiated. Very low quality wood is still being pulped or chipped and other useable aspen is graded; the lower grades are made into pallet, crate or box products and higher grades are used to provide higher value products. Finally, smaller companies begin producing higher value-

added products, primarily for the local market. BC is currently be positioned in an early growth stage as we begin to differentiate between the resource in order to produce increasingly higher value products.

4. There is strong interest in further developing the value-added industry in the Peace.

This is perhaps best evidenced by the strong attendance at the FRBC meeting and the level of participation in the Peace Value-added Wood Association.

5. Opportunities exist with respect to a wide variety of products.

Aspen can be used in a wide variety of primary, intermediate, and final product applications. As in any product, the characteristics of aspen can affect its usefulness or desirability for certain applications. While almost any product that can be made out of wood can be made out of aspen, experience in other jurisdictions indicates that certain types of value-added products are more likely than others to utilize aspen. Some of the more common applications for aspen include:

- Value-added product components;
- Furniture products;
- Cabinets;
- Pallets and wooden boxes; and
- Other products including paneling.

This report provides an overview of the market for these and other products.

6. The demand for wood products is strong.

Markets such as furniture, cabinets and flooring have seen strong increases in demand in recent years because of renewed interest in wood, strong housing start figures, and a rapid expansion of the home remodeling market.

7. The barriers to entry in the value-added sector are relatively low.

Unlike many manufacturing industries, the value-added wood products industry is characterized by relatively small operations with comparatively low capital requirements. On average, value-added firms in BC generated approximately \$6 million in sales in 1994; three-quarters of value-added operations had annual revenues of \$3 million or less. On average, value-added firms employ 35 people with most operations employing 15 or fewer employees.

8. The lack of a custom dry kiln is a major constraint to the development of a local value-added industry.

There are no true custom kiln operations in the Peace, although Canadian Forest Products in Taylor and West Fraser have occasionally dried woods for local companies. As these operations are set up to dry large volumes of softwoods, the local companies have generally not been satisfied with the results. The lack of a drying facility:

- Can force manufacturers to use wood that has a higher moisture content than desired. High moisture content can significantly detract from the quality of the finished product;
- Causes manufacturers to rely primarily on air drying, which can significantly increase their inventory requirements;

- Extends the lead time needed to fulfill orders and, therefore, serves as a major competitive disadvantage vis-a-vis other suppliers; and
- Makes the manufacturers less responsive to customer needs and market opportunities.

The value-added industry in the Peace faces a chicken and egg situation. It can be argued that the region does not have a significant value-added industry because it does not have a custom drying facility. On the other hand, industry has not been willing to develop a custom drying facility in the Peace because the existing value-added industry is not currently large enough to support it.

9. Based on the experience of existing value-added manufacturers in the Peace as well as similar operations in other jurisdictions, the primary market for value-added manufacturers in the Peace will be the domestic market.

Most value-added operators distribute their products within a 200 mile to 500 mile radius of their facility. A 500 mile radius from Dawson Creek or Fort St. John would include Vancouver, Edmonton, Calgary, and smaller centers such as Lethbridge, Prince George, and Victoria.

10. In terms of export markets, the primary market will likely be the United States rather than longer-distance markets such as Japan.

The results of our research indicate that most of the value-added production in BC is distributed in Canada. A study by Forintek indicated that only about one-third of value-added firms generated 25% or more of their revenues from exports. The reliance on the domestic markets tends to be highest for products such as millwork and cabinets.

Statistics Canada indicates that the vast majority of value-added wood products exported from Canada are destined to the United States. Although the value of exports to Japan has been increasing, it is still a small market for BC exports in comparison to the United States. Our interviews indicated some Japanese interest in aspen products because of the white colour of the wood. However, of those operations we interviewed, the only significant exporter of aspen value-added products was a Japanese owned and operated plant in Wisconsin. Other representatives noted that it is a difficult market to penetrate, which has been made more difficult by increased competition from other countries and changes in foreign exchange rates.

11. While there are significant opportunities for development, there are also factors that will constrain the speed at which the value-added industry, based on local hardwoods, will develop.

Some of these factors include:

- There is limited familiarity with aspen and some industry players have a negative perception of the wood, which resulted from the product being processed incorrectly in the past.
- Access to distribution channels, such as retail outlets, may be a constraining factor. For example, in the States, value-added producers list distribution to the retail marketplace as a major concern.
- Value-added producers tend to:

- Have a technical background rather than a marketing or business background;
- Be product driven rather than market driven;
- Have limited access to capital;
- Have limited access to market information; and
- Be quite secretive and work independently.

Most value-added companies start as cottage industries run out of people's homes and serving local markets.

- There tends to be a long learning curve associated with developing a value-added operation. It takes time to learn how to manage the fibre, make products, identify markets, and develop markets. This is especially true for products made out of aspen. Most people currently making value-added products have learned through trial and error and hard work.
- There is concern about the quality of some of the aspen stands. Natural stands of aspen have many trees that are in excess of 40 years old and prone to rot. This rot reduces the quality of the wood and incurs higher percentages of wastage when processed.

Transportation costs, including the costs of transporting in supplies and raw materials and transporting out finished products, can also be a constraint.

POTENTIAL ECONOMIC IMPACT OF THE PROPOSED KILN FACILITY

The kiln facility itself will generate an economic impact in that it will make expenditures in the region and will employ staff members. For example, we estimate that the kiln would pay over \$70,000 annually in wages (representing about 2 person years of employment) and would make other expenditures totaling about \$200,000. In addition, the development itself would involve capital costs of about \$750,000 of which about two-thirds would be made locally.

However, the potential economic impact of the kiln goes well beyond its own direct expenditures and employment. The primary economic impact of the kiln will result from the impetus that it provides to the local value-added industry. The kiln will provide local value-added manufacturers with access to over 4 million board feet of kiln dried lumber annually. Using economic data developed for the forestry, we project that access to over 4 million board feet of kiln dried lumber will:

- **Generate about \$4 million in revenues for value-added operations.** The kiln dried lumber would be used by the value-added manufacturers to produce products that would sell for an average of \$1,000 per thousand board feet of lumber used in its production (or \$1 per board foot). This is conservative, reflecting the expectation that most of the lumber would initially be used for the production of paneling. Over time, the average revenue per board foot would increase as production shifts towards higher value products such as furniture.
- **Create about 31 jobs including the two full-time equivalent jobs at the kiln.** Approximately 1 job would be created for every 140,000 board feet of lumber used. This is lower than the average of 110,000 board feet per job often quoted for the value-added wood sector, which is based on a study of the value-added sector undertaken in 1991. It would be expected that the ratio for the Peace would move towards the 110,000 average as more intensive operations such as furniture production develop in the region. Based upon the

projected capital costs, the cost per job would be less than \$25,000.

- **Payments to government of \$580,000 annually.** If government were to provide funding for the entire capital cost, it would recoup its investment in the form of increased government revenues in less than a year and a half. This total include payments for companies and for direct employees as outlined.
 - The combined revenue of the kiln operation and the value-added operations is estimated to be about \$4.4 million annually. According to the Price Waterhouse annual studies of the forest industry in BC, the industry has paid about 6% of its revenues to government in recent years as income tax, sales tax, property taxes, and taxes included in electricity rates. If we adopt this 6%, the value-added companies and the kiln operation will pay about \$260,000 annually to government.
 - In addition, the workers employed by the kiln and the value-added operations will pay income taxes, Canadian Pension Plan (CPP) contributions and Employment Insurance (EI) premiums. Based upon the ratio in the Price Waterhouse study, payments to government related to direct employees are projected to be about \$320,000 annually.

The job figures include only direct impacts. The kiln would also generate indirect and induced employment:

- Indirect impacts are generated when the kiln or a value-company purchases goods and services from other sectors. For example, a value-added company could purchase lumber, materials, supplies, utility services, and equipment.
- Induced impacts occur when the value-added companies pay employees to produce their products. The employees then spend their wages and salaries which stimulates further economic activity and rounds of spending through the economy.

Price Waterhouse, in their study *The Forest Industry in British Columbia 1996*, used an employment multiplier of 3.0 in determining the total impact of the industry on employment in BC. By applying this multiplier, the number of jobs that would be created is estimated to be 93 and the cost per job would be about \$8,000 based upon the projected capital costs.

NEXT STEPS

A next of steps have to be completed before a business plan for the proposed custom kiln operation can be completed. These steps include:

1. **Firm commitments that they will use the custom kiln facilities must be obtained from the key operators.**

The feasibility study has determined the prices that would have to be charged for the operation to be viable based upon various capacity utilization rates. These prices may be refined during the process of finalizing the business plan, but nevertheless provide a good indication of the prices that would have to be charged. Potential users should review the price structure to determine if they are willing to commit to the facility. Firm commitments will be required before the business plan can be submitted for funding.

2. Opportunities to obtain financing from Human Resources Development Canada and FRBC should be further explored.

Preliminary discussions have been held with both organizations. Now that the feasibility study has been completed, further discussions should be held to assess how likely it is that the facility can obtain funding from either of these sources.

3. Based upon the feedback obtained from government, a financing strategy for the proposed kiln operation has to be developed.

Apart from government funding, other potential sources of funding may include debt and equity financing.

4. The management structure for the proposed kiln operation has to be agreed upon.

If grant financing is provided, the kiln could be owned by the Association and either:

- Be operated directly by the Association, which would hire the staff and oversee operations. or
- Be operated by an organization or individual who is contracted by the Association to operate the kiln.

In both cases, the kiln would be operated in accordance with the policies established by the Association. However, if equity financing is required, the kiln would presumably be owned and operated by the businesses and/or individuals who contributed the capital.

5. Agreement should be obtained on the selection of the kiln.

We have prepared preliminary detailed capital costs estimates for the proposed kiln operation. Additional research may be undertaken to assess the proposed supplier of the kiln equipment and to verify the capital costs.

6. Finalize the business plan and implementation plan.

The business plan should then be developed, reflecting the intended sources and uses of funding, the management structure and the kiln models selected.

7. Current and potential operators should be utilizing this time to undertake further research in order to better define their products and markets.

Our study has provided a brief overview of selected markets for value-added products. Operators who are interested in establishing or expanding operations will have to undertake further research in order to define the specific products they would produce and the markets they will be targeting.

I. INTRODUCTION

A. BACKGROUND

The forest sector has long been a key component of the BC economy. Some statistics that highlight the importance of the forest products industry are:

- Forest industry shipments accounted for 52% of the \$33.4 billion of products shipped by BC manufacturing industries in 1995;
- Forest products accounted for 60% of the \$26.9 billion of exports from BC in 1995; and
- Direct employment in the forest industries accounts for about 6% of provincial employment. In 1995, approximately 106,000 people were directly employed in the forest industry. Including direct and induced employment, the forest industry is estimated to account for 265,000 jobs or about 15% of the total employment in the province.

The Government of BC has indicated that it is committed to getting more value and more jobs out of every tree cut on public lands in the province. The recently announced Jobs and Timber Accord is designed to create 22,400 new direct forest jobs including:

- 6,500 jobs from small business and secondary industry;
- 5,000 jobs from renewing forests;
- 5,900 jobs from forest companies;
- 3,000 jobs from new work arrangements; and
- 2,000 jobs under Fisheries Renewal BC, which will work to restore salmon streams damaged by past forest practices.

Including 17,400 indirect jobs, it is intended that the Accord will create 39,800 jobs by 2001.

The forest industry can be segmented into the primary sector and the value added sector, with the value-added sector consisting of manufacturing operations that utilize the output of lumber products made by the primary sawmills. The value-added sector will be a key component of any future growth in employment. In a previous announcement, the Government of BC set an objective of more than doubling the number of jobs in the for the value-added sector over the next twenty five years

A key contributor to the growth of the industry will be Forest Renewal BC (FRBC). The mandate of FRBC is:

“to plan and implement a program of investments to renew the forest economy of British Columbia by enhancing the productive capacity and environmental values of forest lands, creating jobs, providing training for forest workers, and strengthening local communities that depend on the forest industry”.

In pursuit of this mandate, FRBC delivers a range of programs within five activity areas: Land and Resources, Environment, Workforce, Communities, and Value-added. According to the 1997/98 business plan, FRBC budget allocation by activity area is:

[Data Table unavailable]

II. THE FORESTRY SECTOR IN NORTH EASTERN BC

This chapter provides an overview of the supply of fibre in the region and discusses the value-added industry in British Columbia and, more particularly, the Peace Region.

A. SUPPLY OF FIBRE

1. Annual Allowable Cut

The Annual Allowable Cut (AAC) is the volume of timber that can be harvested on Crown land each year for given management units (either Timber Supply Areas and Tree Farm Licenses). Timber Supply Areas (TSAs) are geographical units that are managed according to a forest management strategy. While the AACs for TSAs are apportioned to a variety of users, Tree Farm Licenses (TFLs) are tenures for a specific geographic area that give the license holder the exclusive right to harvest timber as well as the obligation to directly manage the forest land (with the exception that approximately 5% of the AAC of most tree farm licences is available for sale under the Small Business Forest Enhancement Program).

Responsibility for determining the AAC rests with the Chief Forester of the Government of British Columbia. Section 7 of the Forest Act requires the Chief Forester to consider a variety of factors in determining an AAC including:

- The rate of timber production that may be sustained from the area taking into account the composition of the forest, time required to re-establish the forest, silvicultural treatments including reforestation, standards of timber utilization, constraints on the amount of timber produced from the area for purposes other than timber production, and any other information which relates to the capability of the area to produce timber;
- The short-term and long-term implications to the province of alternative rates of timber harvesting from the area;
- The nature, production capabilities, and timber requirements of established and proposed processing facilities;
- The economic and social objectives of the Crown, for the area, the region and the province, as expressed by the Minister of Forests; and
- Abnormal insect or disease infestations and major salvage programs planned for the timber on the area.

There are 37 Timber Supply Areas (TSAs) and 34 Tree Farm License areas (TFLs) in British Columbia. A map illustrating the location of the TSAs is provided in Table 2.1 on the opposite page. A custom kiln operation located in the Peace Valley potentially could dry wood taken from portions of four TSAs including:

- #46 Mackenzie;

- #47 Dawson Creek;
- #48 Fort St. John; and
- #49 Fort Nelson.

As indicated below, the 1997 AAC for these four TSAs totals about 8.3 million cubic metres of which the coniferous ACC accounts for about two-thirds of the volume.

TABLE 2.2

ANNUAL ALLOWABLE CUT BY TSA

District	Approved AAC 1997 (cubic metres)					
	Coniferous (Softwood)		Deciduous (Hardwood)		Total	
	m3	%	m3	%	m3	%
Mackenzie	2,951,121	100.0%	0	0.0%	2,951,121	100.0%
Dawson Creek	860,173	46.2%	1,000,000	53.8%	1,860,173	100.0%
Fort St. John	1,100,000	54.6%	915,000	45.4%	2,015,000	100.0%
Fort Nelson	600,000	40.0%	900,000	60.0%	1,500,000	100.0%
Total	5,511,294	66.2%	2,815,000	33.8%	8,326,294	100.0%

Predominantly deciduous stands occupy about 7.5% of the productive forest area in the MacKenzie TSA; however, they are currently not harvested and, therefore, no annual allowable cut has been established for predominantly deciduous stands in the Mackenzie TSA. In the other three regions, the deciduous component of the total AAC ranges from about 45% in Fort St. John to 60% in Fort Nelson.

2. Apportionment of the Annual Allowable Cut

Technically, once the AAC for a TSA is determined, the volume is distributed or "apportioned" by the Minister of Forests to various categories of licences that share rights to harvest timber within the TSA. Table 2.3 profiles the apportionment of the coniferous AAC by TSA. As indicated, the majority of the AAC (from 58% in the Dawson Creek TSA to over 90% in the Mackenzie TSA) is apportioned under replaceable forest licenses. These licenses are owned by:

- Finlay Forest Industries and Timbernorth Forest in the MacKenzie TSA;
- West Fraser Mills and Canadian Forest Products in the Dawson Creek TSA;
- Canadian Forest Products in the Fort St. John TSA; and
- Tackama Forest Products in the Fort Nelson TSA.

In addition to the TSA figures shown in Table 2.3*, Canadian Forest Products owns a Tree Farm Licence in the Dawson Creek area with an annual allowable cut of 401,370 cubic metres.

The proportion of the coniferous AAC apportioned to the Small Business Forest Enterprises Program (SBFEP) averages over 10% for the four TSAs, ranging from 5.2% in the Fort Nelson TSA to 20.9% in the Dawson Creek TSA. Across BC, the SBFEP is allocated 13% of the provincial harvest (9.3 million cubic metres).

The Small Business Forest Enterprise Program (SBFEP) provides small companies that are registered in the program access to Crown timber through the competitive sale of timber sale licences. There are two categories of operators:

- Small business loggers (Category 1); and
- Owners of timber processing plants (Category 2).

Across BC, 1,800 market loggers and 400 sawmills are registered as participants. Licensees with replaceable cutting rights having an aggregate allowable annual cut greater than 10,000 cubic metres per year are not eligible to bid. Timber sale licences are awarded competitively in two ways:

- On the basis of a bonus bid; and
- On the basis of a bid proposal.

In bonus bid sales, available to Category 1 and Category 2 registrants, a lower limit or upset price is established and bidders tender an additional amount called the bonus bid (dollars per cubic metre). The bidder with the highest bonus bid is awarded the sale. Bid proposal sales are awarded based on an evaluation of specific criteria such as the value to be added through manufacturing by an applicant's facility, bonus bid (if any), and other government objectives.

Under the Small Business Forest Enterprises Program (SBFEP), the Ministry is responsible for all pre-harvest planning and post-harvest forest management activities. As timber sale licences sold under this program are typically for small volumes of timber, an operator can harvest the timber in a relatively short period of time. Such tenures typically have a short term (from six months to five years) and are not replaceable.

Most of the remaining coniferous AAC is apportioned to non-replaceable licenses. Non-replaceable forest licences are a longer-term tenure than the normal timber sale licence used by the SBFEP. Under a non-replaceable licence, small businesses are responsible for planning, access and silviculture where they harvest. In the past, these activities were done by the Ministry of Forests for all small business sales.

Only about 1% of the AAC is apportioned to Woodlot Licenses. Woodlot Licenses operate on a basis similar to a Tree Farm Licence, but on a smaller scale. They allow for small-scale forestry to be practiced on an exclusive basis in a described area (Crown and private) on a sustained or perpetual yield basis. In most cases, the licence area includes private forest land – usually adjacent or near to the Crown land portion – owned by the licensee. The right to Crown timber is granted in return for licensee's agreement to manage the total licence area according to applicable legislation and regulations. The maximum Crown land portion of a woodlot licence is 400 hectares on the coast and 600 hectares in the interior. Any amount of private land can be included in the licence area. A small volume is also apportioned under the Forest Service Reserve, which is set up to support harvesting under small tenures such as the licence to cut or free use permits.

Table 2.4* profiles the apportionment of the deciduous AAC by TSA. As indicated, most of the deciduous AAC (72%) in these TSAs is apportioned for pulpwood agreements. In addition, about 10% of the AAC (including almost 20% in the Fort St. John TSA) was allocated to the Small Business Forest Enterprise

* Please see Appendices

* Please see Appendices

Program.

3. Harvest Volumes

Table 2.5* summarizes the volumes actually harvested in the four district areas. As indicated, the volume of timber totaled approximately 7 million cubic metres in both 1995 and 1996. Characteristics of the harvest include:

- The vast majority (84%) of timber harvested each year is coniferous, including pine, spruce and balsam (also known as sub-alpine fir);
- The size of the harvest ranges from under 1 million cubic metres in the Fort Nelson District to over 3 million cubic metres in the Mackenzie District.
- In 1996, the deciduous component represented 41% of the timber harvested in the Fort Nelson Forest District, 21% of the timber harvested in the Dawson Creek Forest District, and only 15% of the timber harvested in the Fort St. John Forest District.

Comparing the amount harvested to the AAC provides a rough indication of the extent to which the fibre resource is being utilized. As noted below, the volume harvested in 1996 represents about 79% of the 1997 AAC.

TABLE 2.6

COMPARISON OF THE 1996 HARVEST TO THE 1997 AAC

Type of Wood	AAC 1997, in m ³	Harvest 1996 in m ³	Harvest As % of AAC
Hardwood	2,815,000	1,133,758	40%
Softwood ¹	5,921,291	5,734,061	97%
Combined Hardwood & Softwood	8,736,294	6,876,819	79%

¹ 1997 AAC figures includes 410,000 m³ AAC associated with a tree farm license in the Dawson Creek Forest District

The 1996 harvest as a percentage of the 1997 AAC ranges from 40% of the hardwood AAC to 97% of the softwood AAC, indicating that the opportunities to increase harvest volumes lies primarily with the hardwood resource. On a regional basis, the 1996 deciduous harvest ranged from 21% of the 1997 AAC in the Fort St. John Forest District to 65% of the AAC in the Fort Nelson Forest District.

TABLE 2.7

**COMPARISON OF THE 1996 DECIDUOUS HARVEST
TO THE 1997 DECIDUOUS AAC BY FOREST DISTRICT**

Forest District	AAC 1997, in m ³	Harvest 1996 in m ³	Harvest As % of AAC
MacKenzie	n/a	n/a	n/a
Dawson Creek	1,000,000	360,734	36%
Fort St. John	915,000	189,718	21%
Fort Nelson	900,000	583,306	65%
Total	2,815,000	1,133,758	40%

4. Primary Processing Facilities

Table 2.8* provides a listing of the primary processing facilities by region. As indicated, major producers in the Peace include:

- Canfor, which has major sawmills in Chetwynd, Taylor and Fort St. John;
- Chetwynd Forest Industries, a division of West Fraser Mills, which operates a sawmill in Chetwynd;
- Louisiana Pacific, which operates a pulp mill in Chetwynd and an oriented strand board (OSB) plant in Dawson Creek; and
- Fibreco Pulp, which operates a pulp mill in Taylor.

B. THE VALUE-ADDED SECTOR

This section provides an overview of the value-added sector in British Columbia and, more particularly, in the Peace Region.

8. Definition of the Value-added Sector

There is no formal definition of the value-added sector, although it is generally taken to mean the manufacturing sector which utilizes the output of lumber products made by the primary sawmills. Alternatively, a report by the Revelstoke Economic Development Commission defined “value added” as a process of adding value to wood fibre and increasing economic activity in communities by generating jobs, services and expanding the tax base.

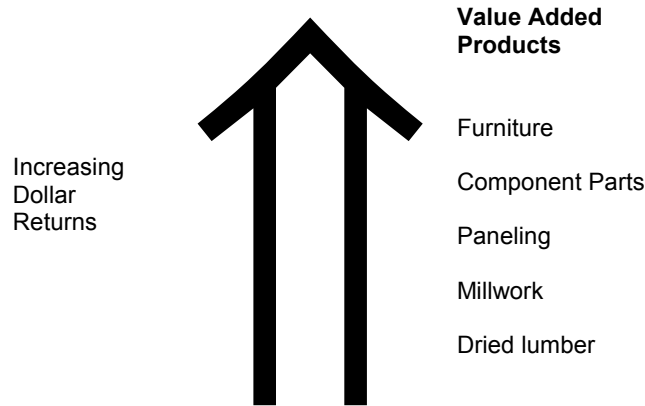
There are many kinds of value added operations, ranging from those which simply supply dried lumber to those which supply intermediate items such as component parts and to those that supply finished products

* Please see Appendices

such as furniture. Typically the closer the value added item is to a finished product, the higher the returns earned as indicated below:

TABLE 2.9

ILLUSTRATION OF ADDED-VALUE



2. Size of Value Added Sector

As indicated in Table 2.11* on the opposite page, according to Statistics Canada data, there were 633 businesses active in the wood processing sector in BC in 1994 (the latest year for which data has been published by Statistics Canada). The value of goods manufactured and shipped by these 633 companies totaled \$11.2 billion and they employed almost 44,000 people.

Over 80% of the value of goods manufactured and 71% of the employment is associated with the sawmill and planning sector. The size of the value-added forestry sector can be estimated by taking the total figures and deducting the number of establishments, value of goods manufactured and number of employees in the sawmill and planning sector. Using this methodology, it is estimated that 380 BC companies were active in the value added sector in 1994 and that these companies manufactured goods valued at \$2.3 billion and employed approximately 13,500 people.

According to the Statistics Canada data, leading value-added wood products include:

- Shakes and shingles;
- Wooden doors and windows;
- Wooden kitchen cabinets and bathroom vanities;
- Other millwork such as flooring, molding and turned wood products;
- Wood preservation, which includes plants that improve the characteristics of lumber and plywood by impregnating it with preservatives or fire retardants;
- Household wood furniture;

* Please see Appendices

- Prefabricated wooden buildings including log homes and factory preassembled components; and
- Other wood industries such as paneling and many other products.

According to Statistics Canada data as well as the results of a major survey published by FORINTEK in 1993, the major characteristics of the value-added industry in British Columbia are as follows:

- **Most value-added firms are located in the Lower Mainland.**

According to the 1993 report, "*Structure and Significance of the Value-added Wood Products Industry in British Columbia*", by FORINTEK and Jim McWilliams, about two-thirds of the value-added plants in BC are located in the Vancouver Forest District as shown below:

TABLE 2.11

**MANUFACTURING STATISTICS FOR THE
BC WOOD PRODUCTS INDUSTRIES, 1994**

Sector	Number of Establishments	Value of Goods Manufactured		Employment	
		Millions	%	Number	%
Sawmill and Planing Mill	253	\$8,906.5	79.5%	30,432	69.5%
Shingle and Shake	46	227.0	2.0%	1,392	3.2%
Hardwood Veneer and Plywood	2	n/a	n/a	n/a	n/a
Softwood Veneer and Plywood	19	n/a	n/a	n/a	n/a
Prefabricated Wooden Buildings	18	77.3	0.7%	546	1.2%
Wooden Kitchen Cabinet and Bathroom Vanity	83	168.4	1.5%	1,759	4.0%
Wooden Door and Window Industry	47	209.5	1.9%	1,479	3.4%
Other Millwork Industries	54	224.5	2.0%	1,631	3.7%
Wooden Box and Pallet Industry	5	17.7	0.2%	121	0.3%
Coffin and Casket	1	n/a	n/a	n/a	n/a
Wood Preservation	18	114.1	1.0%	332	0.8%
Particle Board	7	n/a	n/a	n/a	n/a
Wafer Board	1	n/a	n/a	n/a	n/a
Other Wood Industries	39	80.7	0.7%	735	1.7%
Wooden Household Furniture	40	103.7	0.9%	985	
Total	633	\$11,207.4	100.0%	43,780	100.0%

Source: Statistics Canada

Note: n/a indicates that Statistics Canada has not released the data because of confidentiality issues caused by the small number of establishments included in that category.

TABLE 2.12

DISTRIBUTION OF PLANTS BY FOREST DISTRICT

Forest District	Percent of Plants
Vancouver	66%
Kamloops	21%
Prince George	5%
Nelson	5%
Cariboo	2%
Prince Rupert	1%
Total	100%

➤ **On average, value-added firms employ 35 people.**

As indicated below, over 50% of the value-added operations had 15 or fewer employees and only about 11% had more than 50 employees.

TABLE 2.13

SIZE OF PLANTS IN BRITISH COLUMBIA BY NUMBER OF EMPLOYEES

Number of Employees	% of Plants
1 to 5	16.6%
6 to 10	19.5%
11 to 15	19.2%
16 to 25	17.9%
26 to 50	15.8%
51 to 75	5.2%
76 or more	5.7%
Total	100.0%

Source: FORINTEK 1993 study.

- **Only 7% of the value-added companies in the FORINTEK study indicated that they produced 25% or more of their products from hardwoods grown in British Columbia.**

Sixteen percent indicated that they used hardwoods grown in other jurisdictions. Hardwoods tended to be used for millwork (such as flooring and mouldings), cabinets and furniture.

- **On average, value-added firm generated about \$6 million in sales in 1994.**

As indicated below, the 1993 FORINTEK report found that over three-quarters of the value-added operations had annual revenues of \$3 million or less as indicated below:

TABLE 2.14

SALES REPORTED BY VALUE-ADDED FIRMS

	Value	% of Plants
Smaller	Less than \$1 million	47.1%
	\$1.1 to 3 million	30.3%
		77.4%
Medium	\$3.1 to 5 million	9.4%
	\$7.1 to 10 million	5.6%
	\$10.1 to 15 million	3.2%
		18.2%
Larger	\$15.1 to 25 million	2.1%
	Over \$25 million	2.4%
		4.4%
Total		100.0%

- **The primary market for value-added companies is British Columbia and, to a lesser extent, the United States and the rest of Canada.**

According to the 1993 FORINTEK report, approximately 78% of the value-added firms generated 25% or more of their revenues from customers in BC and 26% generated 25% or more of their revenues from customers in the United States. As indicated below, only 13% of the firms generated 25% or more of their revenues from sales to the Pacific Rim.

TABLE 2.15

PERCENT OF VALUE-ADDED FIRMS GENERATING 25% OR MORE OF THEIR REVENUES FROM SELECTED MARKET AREAS

Market Area	Number of Plants	% of Plants
British Columbia	265	77.9%
Rest of Canada	43	12.0%
United States	91	25.5%
Europe	28	7.8%
Pacific Rim	48	13.4%

Most of the companies that were exporting to the Pacific Rim were marketing engineered building components, most notably log homes. As indicated below, manufacturers of millwork, cabinets and furniture almost exclusively targeted at North American markets.

TABLE 2.16

PERCENT OF VALUE-ADDED FIRMS GENERATING 25% OR MORE OF THEIR REVENUES FROM SELECTED MARKET AREAS BY TYPE OF PRODUCT

Market Area	Type of Product		
	Millwork	Cabinets	Furniture
British Columbia	91.6%	97.7%	70.6%
Rest of Canada	10.8%	2.3%	26.5%
United States	7.2%	4.5%	29.4%
Europe	0.0%	0.0%	8.8%
Pacific Rim	2.4%	0.0%	5.9%

Table 2.17* on the opposite summarizes the growth in exports over the past five years for selected wood products. As indicated, the value of exports for these products has increased two to three fold over the past five years with most of the growth occurring in the US market. There has also been significant growth in exports to Japan, although it is believed that the value of these exports are now declining because of changes in the value of the yen.

* Please see Appendices

The figures in Table 2.17* are not directly comparable to the production values outlined in Table 2.11 because:

- Exports may occur further down the distribution channel and, therefore, additional mark-ups may be included in the values; and
- These figures include all exports from British Columbia and, therefore, may include the value of goods manufactured in other jurisdictions but exported through BC.

3. Value-added Activities in the Peace Region

The value-added wood industry in the Peace Region is in an early stage of development. Eight of the Peace Value-added Wood Association members are currently producing value-added products in the region. Most of the companies have been established in the past five or six years. Based upon the results of our interviews, we estimate that these companies are generating about \$500,000 in revenues annually from the sale of the value-added products they produce (excluding sawmilling services). A brief description of the products produced by these companies includes:

- North Country Creations, based in Fort St. John, produces a wide range of products from aspen and poplar such as dining room suites, desks, cabinets, entertainment units, bedroom suites, flooring, and doors.
- Lodgepole Pine Industries, based in Fort St. John, produces flooring, siding, interior paneling, moldings and tongue and groove products. Most of the products are produced from pine although some birch and polar is also used.
- For Can Ventures, based in Chetwynd, operates a sawmill and has produced log cabin siding and occasionally a timber home.
- Willow Valley Wood Products, based in Dawson Creek, produces flooring, paneling, and moldings from a variety of materials including aspen, birch and pine.
- Redekopp Mills, based in Chetwynd, produces squares for use in Japanese post and beam construction as well as complete home packages.
- Hudson Hope Log Homes, based in Hudson Hope, manufactures complete log homes from poplar and birch.
- Garbitt Wood Products, based in Chetwynd, has produced a range of products including cabinets, furniture and home components.
- Dooley's Woodworking, based in Baldonnel, produces mantles, brackets, wood shelves, gift products, picture frames, toys and other products from pine and oak.

A number of other individuals in the Peace are currently examining opportunities to get into the value-added sector. In addition, some existing primary producers are considering the development of value-added products. For example, Emporium Investments, based in Pouce Coupe, has been researching shake and shingle products. Canfor indicated that they may develop value-added products over the next two years, perhaps taking advantage of their existing marketing infrastructure in North America and Japan. Louisiana Pacific has examined a number of value-added products, ranging from furniture to jousts and stickers, but is unlikely to make the investment required over the next few years.

TABLE 2.17

**VALUE OF SELECTED PRODUCTS EXPORTED FROM BRITISH COLUMBIA
1992 TO 1996
(\$millions)**

Product and Market		1992	1993	1994	1995	1996
Wooden Kitchen Cabinets and Bathrooms Vanities						
	United States	\$4.4	\$4.6	\$8.5	\$8.4	\$11.0
	Japan	0.2	0.4	1.2	2.4	3.6
	All Markets	\$5.2	\$5.2	\$9.9	\$11.5	\$14.9
Wooden Doors and Windows						
	United States	\$11.4	\$13.8	\$21.5	\$26.0	\$25.1
	Japan	0.7	1.2	3.0	4.0	7.3
	All Markets	\$14.5	\$16.5	\$25.8	\$32.1	\$33.1
Wooden Furniture						
	United States	\$19.3	\$23.8	\$37.8	\$35.6	\$49.8
	Japan	0.9	0.7	2.0	5.8	6.4
	Other Export Markets	\$22.5	\$27.4	\$43.7	\$44.4	\$58.7
Wood Boxes and Pallets						
	United States	\$2.7	\$2.7	\$4.2	\$2.4	\$7.4
	Japan	0.0	0.0	0.1	0.0	0.3
	Other Export Markets	\$2.7	\$2.4	\$4.3	\$2.5	\$7.8

III. KILN OPERATION

This chapter provides a brief overview of custom kiln operations in BC, identifies kilns that currently operate in the Peace area, reviews the potential volumes for a custom kiln in the Peace, and proposes a design for a custom kiln that would operate in the region. Included in the design is a review of the potential capital costs, operating costs and sources of financing.

A. CUSTOM KILN OPERATIONS

In order to better understand the nature of a custom kiln operation, we undertook a survey of 15 custom kiln operators in British Columbia. From these interviews, we obtained information on their facilities and equipment, markets, volumes, species handled, pricing, capital costs, operating costs, ownership and management, and complementary services and businesses. The major findings are summarized below:

- **The only true custom kiln operations in BC are based in the south and on Vancouver Island.** While the Canadian Forest Products facility in Taylor does do some custom drying, this is clearly not the focus or priority of the operation.
- **There are only a handful of operations in BC that derive most of their revenues from custom work.** Of the 112 kiln operators in the south and on the coast that are listed in the 1996 BC Kiln Directory, 48 indicate that they provide at least some custom drying services. However, according to our research, most of the “custom dryers” are focused almost entirely on drying their own wood and dry only small volumes for other customers.
- **Most custom kiln operations provide a range of services** such as grading, planing, sorting, trimsawing, resawing, packaging, strapping and loading . Some operators earn as much as 50% of their custom revenues from these services.
- **Custom kiln operators tend to have strong technical skills but underdeveloped business skills.** Interviews with the custom kiln operators, kiln association representatives and others associated with the industry indicate that marketing is almost entirely word-of-mouth even though capacity utilization tends to be low. Apart from their own supply, most operators generate most of their volume from one or two customers. It can be difficult for kiln operators, particularly those with highly integrated operations, to understand the full costs associated with operating their kilns.
- **Prices tend to be set based what the operator feels competitors are charging and/or what the customers are willing to pay.** These prices may not cover the full costs of the kiln operation. This is particularly true for kiln operations which are focused primarily on drying their own lumber; if their kiln is sitting empty, operators may be willing to charge customers little more than the direct costs of stickering/destickering, loading and unloading, and heating the kiln.

Prices tend to start at \$110 per Mfbm and go up depending upon cycle time (species and moisture content). Prices can be lower in the Lower Mainland. Prices for specialty products (eg. hardwood or high quality lumber) can be much higher.

- **Most of the equipment is old, which means that depreciation costs are low.** The technology has changed relatively little over the years. However, some of the operators have purchased computer control systems to improve efficiency. Some of the operators built the kilns themselves in order to minimize capital costs.

- **Most operators deal with very standard products, namely dimensional softwoods.** Most have very little experience with hardwoods.
- **Most operators state the key to success is having a good kiln operator.** Good operators are said to take a personal interest in producing quality dried wood and pay close attention to details.
- **All of the operators surveyed stated that quality dried wood, and not price, is the determining factor for repeat business.**

Our survey included interviews with two kiln operators whose businesses may be somewhat similar in nature to the proposed operation. These are Rebco Wood Products Ltd. and V.I. Independent Pride Wood Products Ltd., each of which is briefly described in the following paragraphs.

9. Rebco Wood Products Ltd.

Rebco, based in Port Alberni, is relatively similar in nature to the proposed operation in that it is a true custom kiln operation which produces 5 million to 6 million board feet annually, relies on two large customers who act as anchors for the operation and 10 to 20 smaller customers, and kiln dries some Lodgepole Pine (although most of the volume is hemlock/fir). The major differences between the proposed kiln and Rebco's operation is that Rebco's facility has larger kilns than would be likely be used by the proposed operation, offers many other services in addition to kiln drying and does not dry hardwoods.

It was established in 1995 by two partners, one of whom is a steam engineer and one who has years of experience with a major lumber producer. The owners bought three kilns and during installation modified the design by adding additional fans. These additional fans create more even air flow resulting in better quality dried wood. The three kilns include a 125 Mfbm Dehumidification Kiln, a 84 Mfbm Heat and Vent kilns, and a 60 Mfbm Heat and Vent Kiln. In addition to the kiln drying, Rebco's operation includes moulder, resaw, grading, sorting, and manual chopline services. The covered storage area totals 5,000 square feet.

The prices typically charged by the operation range from \$120/ Mfbm to \$524/Mfbm depending upon the length of time in the kiln. The company generates about 50% of its income from kiln drying and 50% from other services.

10. V.I. Independent Pride Wood Products

V.I. Independent Pride Wood Products is a true custom kiln operation based in Coombs. The major differences between the proposed kiln and V.I. Independent's operation is that V.I. Independent's facility has kilns which are likely smaller than would be purchased by the proposed operation, provides a range services in addition to kiln drying, and does not dry hardwoods.

V.I. Independent was established in 1992 by one owner. The owner began by building one small kiln and obtaining education about kiln operations from the University of British Columbia. The operation was then expanded with another kiln being built and a third kiln being purchased from a manufacturer. Presently, the operation has three kilns, including one Dehumidification kiln and two Heat and Vent kilns. The kiln charge sizes are 10 Mfbm, 20 Mfbm, and 36 Mfbm for a total charge capacity of 66 Mfbm. In addition to kiln drying, V.I. Independent provides grading, sorting, packaging, and manual chopline services.

The price charge for drying softwoods typically ranges from \$110 to 150/Mfbm, but may increase to \$200 to 250/Mfbm depending upon the services provided. Most of the operation's income is generated from the drying operation rather than from other services.

B. KILNS IN THE PEACE REGION

There are no true custom kiln operations in the Peace, although Canadian Forest Products in Taylor and West Fraser have occasionally dried woods for local companies. As these operations are set up to dry large volumes of softwoods, the local companies have generally not been satisfied with the results.

In addition to the large mills, a few small operators have set up kiln facilities in the Peace. These include:

- Willow Valley Wood Products, based in Dawson Creek, has a 4,000 board foot kiln and is currently investigating the option of developing a 25,000 board foot kiln;
- Peaceview Sawmills Ltd. has recently built a 3,000 board foot kiln for its sawmill in Baldonnel; and
- KSS Industries in Hudson Hope has built a 6,000 board foot wood waste kiln.

C. POTENTIAL VOLUMES FOR A CUSTOM KILN OPERATION IN THE PEACE

The potential kiln could serve a variety of customers including:

- Companies who harvest and breakdown timber in the area for transport elsewhere;
- Value added operations in the area; and
- Companies that mill lumber in other regions and transported it to, or through, the Peace.

In order to assess the potential volumes that could be put through the kiln, we conducted interviews with members of the Peace Value-added Wood Association and with other potential users. The major findings are summarized below:

- **The strongest commitment for volumes to be put through the kiln in the first year is from Abeda Wood Products.** Abeda is a wall paneling manufacturer, based in Winfield, that has a Section 21 licence (formerly Section 16.1) under the Small Business Forest Enhancement Program to harvest timber in the Fort St. John area. It is a three year license that is scheduled to expire on January 27, 2000. The company fully expects to obtain additional licenses in the Fort St. John area in the future.

Abeda Wood Products has been very supportive of the concept of developing a custom kiln operation in the Fort St. John area. They are interested from two perspectives:

- In the short-term, they will be transporting lumber obtained under Section 21 from the Fort St. John area to their operation in the Okanagan. If there is no kiln operation open to them in the area, they will be forced to transport the lumber green. That means that they will be incurring additional costs for transporting water which they will later remove by drying the lumber in one of their kilns in Winfield. If there was a kiln open to them in the Fort St. John area, Abeda feels the net cost to them of drying the wood there would be more than offset by the savings in transportation costs.

- More importantly, the company is also seriously considering establishing a value-added operation in the Fort St. John. Currently the company contracts some services from North Country Creations, a local value-added producer. If a kiln was established in the area, Abeda has indicated that they would likely expand this relationship and establish value-added facilities in the Fort St. John area.

Abeda expects that they could put through 3 million to 6 million board feet a year, consisting primarily of lodgepole pine.

- **Based upon their existing production, it is expected that existing value-added producers would put through 80,000 to 100,000 board feet in the first year.** However, the members of the Peace Value-added Wood Association feel that their volumes will increase sharply once the kiln was in place. For example, existing producers indicated that they expect their volumes to increase to 400,000 to 500,000 board feet a year within a relatively short time after the kiln was built.

The results of our interviews indicate that availability of fibre is generally not perceived as a constraint. Most of the representatives surveyed are able to obtain the fibre they need from primary producers, from private lands, and from 16.1 sales. In particular, as discussed in Chapter II, hardwoods such as aspen, aspen and birch are underutilized. For example, for a 16.1 contract last year, no one even put in a bid for 70,000 cubic metres of aspen. An opportunity to utilize small diameter pine has also been identified.

The results of our interviews also confirm industry's perception that the lack of a custom drying facility is a major constraint to the development of the value added sector. The lack of a drying facility:

- Negatively impacts the inventory requirements of manufacturers;
- Extends the lead time needed to fulfill orders;
- Makes the manufacturers less responsive to customer needs and market opportunities; and
- Means that some manufacturers are using wood that has a higher moisture content than desired. High moisture content can significantly detract from the quality of the finished product.

The value-added industry is faced with the chicken and egg situation. It can be argued that the region does not have a significant value added industry because it does not have a custom drying facility. On the other hand, it can also be argued that industry has not been willing to develop a custom drying facility in the Peace because the existing value-added industry is not large enough to support it in the short-term.

- **As evidenced by the strong interest in the Association, many other people are considering getting into the value-added industry.** However, because they do not have existing operations, these individuals can only provide soft commitments to utilize the facility. Apart from drying requirements, there may be other constraints that will slow the speed at which these individuals will enter the value-added industry. For example:

- They may not yet have defined the products they would produce or the markets they would be targeting;
 - They don't yet have the equipment they need;
 - They may have limited financing available; or
 - It will take them time to plan and start/expand and develop their operation.
- **Not all value-added operators in the Peace would use a custom kiln facility.** As noted earlier, some operators have already developed their own small drying facility while others are considering doing so . The location of the facility will also have an impact on use of the facility; for example, some operators in the South Peace indicated they are unlikely to utilize the facility if it is based in the North Peace and vice versa.
- **Although no commitments were made, some other companies indicated that there is potential for them to put significant volumes through a custom kiln operation.** For example:
- Representatives of Emporium Investment Limited indicated that, if the facility was based in Fort St. John, they may be interested in putting through substantial volumes (perhaps up to 5 million board feet) through a custom kiln operation;
 - Ted Coe is a broker who moves about 5 million board feet annually and would be interested in a custom kiln operation;
 - Manning Forest Products processes aspen in Northern Alberta and transports it green to various markets including some value-added processors in BC. The company may be interested in drying volumes which are transported to the BC market;
 - Clearco is a remanufacturer based in Alberta that has their own drying facility but would be interested in custom drying during periods when their facility is operating at capacity.

Our interviews indicate that the potential volumes that could be put through could range from 5 million to 10 million board feet per year. The key finding is that the primary limitations on the size of the facility is likely not the potential volumes that could be put through but rather:

- The ability of potential customers to commit to specific volumes; and
- The availability of capital.

Based on discussions with Abeda and Association members, it was decided that we would develop capital and operating costs estimates based on facilities that include:

- a 40,000 to 50,000 board foot kiln; and
- a 20,000 board foot kiln.

The rationale for this configuration includes:

- It will enable the facility to cater to the requirements of one large value added user who will put through fairly standardized pieces of lumber, and many small users who will put through more variable pieces of lumber in terms of species, moisture content, thicknesses and lengths;
- The capital costs and working capital requirements will be less than \$800,000; and
- It is consistent with truck load volumes.

It is anticipated that the facility would increase in size as the operation becomes more established and as the local industry develops.

D. PRELIMINARY DESIGN AND PROJECTED CAPITAL COSTS

The preliminary kiln facility design is based on information drawn from interviews with association members, other potential users, 15 custom kiln operations and 17 kiln manufacturers. Secondary information was also considered. The preliminary design of the kiln is outlined in the following paragraphs.

11. Kiln Location

The Peace Value Added Wood Association has members throughout the Peace Valley area. When surveying the members, numerous sites were mentioned as possible locations for the kiln facility. The factors that should be considered in the selection of the kiln location are:

- The site must have access to gas and utility lines as well as highway and possibly rail access;
- It should be located close to a facility with whom it can share employees. Operation of the kiln itself is not a full-time job. Most custom kiln operations provide a range of services. To effectively minimize labour costs in the absence of other services, it would be useful to co-locate the kiln with another operation that could use these workers and perhaps could share equipment such as a forklift;
- The location should be consistent with the needs of the major customers;
- Land should be available at the site to support future expansion.

The facility is likely best located in the Fort St. John area given that both major potential customers (Abeda and Emporium) as well as two of the leading value-added manufacturers expressed a strong preference for this location. It may be possible to complement this facility by establishing one or more small kilns in other areas of the region.

12. Kiln Facility Layout

The basic elements of the kiln facility are as follows:

- 2 kilns;
- 1 boiler;
- Green storage/stickering area; and

- Dry storage area.

The layout of the facility revolves around the kilns. The boiler is incorporated into the kiln space. Located to one side of the kilns is the green storage/stickering area and to the other side is the dry storage area. The amount of space required for green storage/stickering and dry storage is outlined below:

- According to a number of sources, kiln ready lumber (the green sticked lumber) should be stacked no more than two packs high. Each pack is 4 feet in length, and consists of approximately 800 bft. Around each of these stacked packs is a 1 foot separation space. Including all the area needed for the kiln ready stock, the working space and the newly arrived green lumber, approximately 14,000 square feet¹ is needed for the green storage/stickering area.
- With respect to the dry storage area, the general rule of thumb is to double the space allocated for the green lumber. Therefore a 28,000 square foot area should be set aside for the purposes of storing the dry lumber. In addition, dried lumber needs to be covered to protect against the elements and, consequently, a dry storage building needs to be constructed. The space allotted for dry storage could be reduced depending on the shipping arrangements.

13. Kiln Facility Requirements

Specific requirements with respect to the site, dry storage building, kiln equipment, and boiler are discussed in the following paragraphs.

1. The Site

¹ The estimates for the green storage/stickering area are derived working backwards from the kiln space as illustrated below:

- 18,850 bft kiln, 16 x 20 x 25.3 = 4 packs high, by 5 depth by 6 width, add 1 foot boarder around each. Therefore 25 x 32, by 2 times the area = 1,600 square feet;
- 52,300 bft kiln, 24 x 32 x 25.3 = 6 packs high, by 8 depth by 6 width, add 1 foot around each. Therefore 41 x 32 by 3 times the area = 3,936 square feet.

Therefore, an area of approximately 5,600 square feet is required to just hold the kiln ready, green stickered stock.

- double space for all holding of green stock = 11,200 square feet
- add working space 50 x 50 (est.) = 2500 square feet
- area for the green/stickered stock = 14,000 square feet

The site set aside for the kiln facility needs to be paved to withstand heavy equipment². This paved area should include space for green storage/stickering, dry storage, allowances for easy access and a flow of movement throughout the site, and a roadway surrounding the site for shipping purposes.

²

According to Columbia Bitulithic Ltd.

2. Dry Storage Building

Once the wood has been kiln dried it needs a covered area for cooling, desticking and storage. This structure is very basic, typically consisting of a roof and a few supporting beams.

3. Kiln Equipment

Style: Side Loading

Number and Size: 2 kilns, approximate charge size of 50,000 bft and 20,000 bft

Type: Heat/Hot Water

Style

There are basically two styles of kilns utilized by value added companies - track loading and side loading kilns. In a business context, the reason for choosing between a track loading and side loading kiln is the decision to be more capital intensive or labour intensive. Track loading kilns are more capital intensive, are more expensive to install and require additional funds for equipment such as carts. Side loading kilns are less expensive; however, they require more time for loading and unloading of the kiln. For this application, side loading kilns are the better option because they are less expensive and because load/unload times are not a major issue because of the small size of the kilns.

Number and Size

All of the custom kiln operations surveyed had several kilns rather than one large kiln. Moreover, most of the facilities had a variety of sizes in order to meet the varying needs of their customers.

Type

Kiln technology ranges from the traditional/conventional to the experimental. A partial listing of the various technologies used to dry wood includes:

- Direct fire kilns that use dry heat;
- Low pressure steam kilns;
- Dehumification kilns;
- Solar powered kilns;
- Vacuum kilns;
- Radio wave frequency kilns; and
- Laser technology kilns.

Most of the representatives we interviewed indicated that it is not the type of technology that determines the quality of the dried wood but instead it is the skill of the kiln operator. The process of drying wood is considered partly an art and partly a science. There is a trend towards more expensive kilns, both in terms of the kiln type and control systems. However, many of the representatives we surveyed indicated that the benefits often did not warrant the additional cost. In addition to higher capital costs, newer technology kilns often require greater training and may result in higher operator, maintenance, servicing and energy costs.

In putting together this report, we obtain quotes from 15 manufacturers of kiln equipment. A matrix highlighting the position of some of these suppliers in terms of the cost of their equipment and the nature of their technology is provided below.

TABLE 3.1

**POSITION OF SELECTED COMPANIES IN TERMS OF
TECHNOLOGY AND COST**

High	Cost
Airodyne Round Kiln, Frank Control Systems Old	Heatwave Radio Wave Frequency Kiln New
Technology	Technology
Koetter Heat /Hot Water Kiln or Traditional Air Drying Method Low	Energy Concepts Inc. Solar Powered Kilns Cost

For the purposes of developing capital and operating cost estimates, we have focused on utilizing a proven older technology with lower energy and maintenance costs such as the heat/hot water method.

Boiler

Natural Gas Boiler 4,000,000 BTU output

Most kiln operations have multiple kilns serviced by one boiler. Once the boiler is installed, it is usually not replaced or upgraded. Taking into account the forecast of the Peace Value Added Association members, we recommend that the boiler be able to accommodate the increasing requirements of a growing value added industry. Therefore, although a natural gas boiler with a BTU output of 2,000,000 may be able to handle the initial requirements, we have costed out a boiler with a BTU output of approximately 4,000,000. This boiler would be flexible enough to offer the 15,000 BTU/1000 Bft needed for aspen/hardwood drying and the

25,000 BTU/1000 bft needed for quicker pine/softwood drying.

14. Projected Capital Costs

We estimate that the capital costs to build the kiln facility, as outlined above, would total approximately \$750,000 as shown below:

TABLE 3.2

PROJECTED CAPITAL COSTS

<u>Cost Item</u>	<u>Amount</u>
Site paving	\$77,000
Dry storage building	168,000
Kilns	255,000
Boiler	37,000
Wiring: electrical supply line	800
Piping: gas line & water line	2,400
Concrete for kilns: materials & labour	20,100
Installation: kilns, boiler & heat exchanger	90,000
Land	45,000
Contingency	54,700
Total	<u><u>\$750,000</u></u>

A description of some of the assumptions underlying this estimate is provided below:

- The site paving costs were derived using a formula given by the Prince George office of Columbia Bitulithic Ltd. based of tons of asphalt, price per ton (given as \$80.00/ton) and an estimation of the site size.

The required green storage/stickered area is a function of the pack size (figures given by Abeda), the kiln charge size (estimated by the dimension of Koetter Dry Kilns), and the area required for green stickered wood (figures given by Nyle Kiln Company). Then dry storage area was calculated using the rule of thumb given by the Nyle Kiln Company, and work flow and shipping requirements. As outlined earlier, the required size for the green storage/stickered area is 14,000 square feet, the required dry storage area is 28,000 square feet, the kiln area is 2,600 square feet, the work flow area (kiln loading etc.) is 2,400 square feet, and the paved area for shipping is 10,000 square feet giving a total of 57,000 square feet for the kiln facility site area.
- The dry storage costs were based on truss estimates for a 28,000 foot building from Intercoast Truss & Prefab, and a rough post and beam costs. Truss costs are \$3 per square foot; posts and beams double the cost to \$6 per square foot.

- The kiln, boiler, wiring, piping, concrete, and installation costs are based on figures provided by Koetter Dry Kiln. The quotes obtained from Koetter were \$158,000 for a 52,300 bft charge load kiln and \$97,000 for a 18,850 bft charge load kiln. We used an exchange rate of \$1.40 Canadian per \$1 US.

The selection of the kiln supplier will be further examined when the business plan is developed. For the purposes of the feasibility study, the Koetter model was selected because a prefabricated kit model was preferred, its capital costs were well developed and were slightly lower than those provided by most other suppliers, and because the company is eager to establish a greater presence in British Columbia. Possible concerns about Koetter are its appropriateness for a northern climate and the fact that the 50,000 board foot model is the largest model built by Koetter.

- The cost of industrial land is approximately \$15,000 to \$30,000 per acre in the Fort St. John area, which is equal to \$30,000 to \$60,000 for a two acre parcel.
- The contingency amount is based on extra costs to prepare the site as given in the Koetter quotation plus an additional \$50,000 of the total costs to cover cost overruns and items not included.

E. PROJECTED OPERATING COSTS

There are three types of operating costs associated with a kiln operation, two of which are variable in nature and one of which is fixed.

- Some costs vary **per charge** and are not affected by how long the wood is in the kiln. These include the costs of stickering and destickering as well as the costs of loading and unloading the kiln.
- Some costs vary depending upon the **kiln time** (how long the wood is in the kiln). This includes energy costs and the costs of managing the wood while it is in the kiln.
- Some costs are **fixed** and do not vary depending upon how many charges are put through or how long the cycles are. These costs would include maintenance, insurance, and depreciation.

A description of these costs is provided in the following paragraphs.

15. Per Charge Costs

The cost is projected to be \$1,545 per charge for the larger kiln and \$565 per charge for the smaller kiln as outlined below.

**TABLE 3.3
PROJECTED OPERATING COSTS PER CHARGE**

Cost Items:	Estimated Per Charge Costs		
	Large Charge 52,300 bft	Small Charge 18,850 bft	Combined 71,150 bft
Stickers:			
materials, sticks and bolsters	\$700	\$253	\$953
labour, stickering & destickering	<u>654</u>	<u>235</u>	<u>889</u>
	1,354	488	1,842
Load/unload:			
fork lift, fuel	70	25	95
fork lift, labour	<u>46</u>	<u>17</u>	<u>63</u>
	116	42	158
Miscellaneous	75	35	110
Total	<u>\$1,545</u>	<u>\$565</u>	<u>\$2,110</u>

The assumptions underlying the per charge cost projections include:

- The load sizes are in accordance with the kilns supplied by Koetter. These kilns approximate the 50,000 bft and the 20,000 bft required. The exact charge sizes are 52,300 bft and 18,850 bft respectively.
- The stickering materials costs were derived from per stick and per bolster costs given by C & C Lathe and confirmed by Koetter Dry Kilns. The sticks can range in price from \$.38 to \$.65 each. The \$.38 sticks can be 11/16 thick by 1 ½ inches wide and 47 ¾ inches long. The \$.65 sticks can be ¾ or 7/8 inches thick and 2 ½ inches in width. According to Koetter Dry Kilns, it is better to buy the more expensive sticks as they are more durable and typically last 10 kiln charges. The bolsters are approximately \$1.20 each and should last at least 10 kiln charges. Kiln sticks, for both soft and hardwoods, according to Koetter, are placed every 2 ft./layer/package of wood. This amounts to approximately 9,972 sticks/52,300 bft charge and 3,600 kiln sticks/18,850 bft charge. Bolsters are placed under the load, between the packages of wood and on top of the load. There are approximately 433 required/52,300 bft charge and 156 required/18,850 charge, according to Koetter. Assuming a 10 kiln charge life for both the sticks and the bolsters, the actual stick and bolster costs of materials per charge can be divided by 10; therefore, the effective per load cost is \$700/52,300 bft charge and \$253/18,500 bft charge.

- The stickering labour rate was derived from manual stickering time estimates given by Abeda and a nominal \$10/hour labour rate. It should be noted that the \$10/hour rate was assumed for the ease of calculations and a union rate of approximately \$12 to \$14/hour may be a more realistic amount. The manual sticking time given by Abeda was 30 minutes for every 800 bft; in other words, it takes 30 minutes to stick 2 packages of wood (1,600 bft/hour).
- The forklift figures were calculated from fuel cost estimates given by Finning Equipment and labour time estimates given by Abeda. Finning estimated \$15/hour for fuel cost, if propane was used. Abeda estimated that it would take 2 hours for a fork lift operator to load and unload a 45,000 bft kiln charge (22,500 bft/hour).
- The miscellaneous category would include the cost of banding, truck loading and unloading, and time associated with invoicing for loads.

The kiln operation could also charge users for wrapping their kiln dried lumber. According to industry sources, the cost of this services ranges from \$10 to \$12 per thousand board feet (including \$7 to \$8 for paper costs and \$3 to \$5 per thousand board feet for labour). Because the costs are expected to be directly recouped from the customers, we have not included the wrapping expense in the per charge costs.

16. **Kiln Time Costs**

We have calculated kiln time costs on a per diem basis to reflect the fact that costs vary depending upon how long the wood is in the kiln. For example, wood that takes 14 days to dry may incur much higher energy costs than wood that takes 4 to 5 days to dry. Kiln time includes the cost of energy and the cost associated with monitoring the wood while it is in the kiln.

It is estimated that it costs \$220 per day to operate the kilns, as shown below:

TABLE 3.4

PROJECTED KILN TIME COSTS PER DAY

<u>Cost Item</u>	<u>Estimated Daily Kiln Costs</u>		
	<u>Large Charge</u> <u>52300 bft</u>	<u>Small Charge</u> <u>18850 bft</u>	<u>Combined</u> <u>71150 bft</u>
Gas	\$46	\$23	\$63
Electricity	78	39	107
Labour	25	25	50
Total	\$150	\$97	\$247

The assumptions underlying these projections are as follows:

- Gas costs were derived from usage figures supplied by Koetter and rates given by BC Hydro. After a long series of calculations, the gas usage for the larger kiln was projected to be 10 GJ a day, at an average yearly cost of \$4.64 per GJ. Smaller kilns tend to be less efficient one a cost per thousand board feet basis. As a result, we have assumed that gas and electricity costs for the smaller kiln would be about one-half those of the larger kiln.

- Electricity costs were derived from usage figures supplied by Koetter and rates given by BC Hydro. As for usage, it is estimated to take approximately 12,069 kwh to dry a kiln charge of 111,111 bft of wood. This usage can be spread over any number of days depending on the moisture in the wood, level of heat and the fan speed. The rate for electricity is \$.0649/kwh. Electricity costs for the largest kiln would then total approximately \$390 for the large 52,300 kiln charge, which would be equal to \$78 per day if we assume a five day cycle.
- Labour cost to oversee the daily kiln operation is estimated using the \$25 hourly rate currently paid on an annual basis to the Abeda kiln manager. According to Abeda, and confirmed by Koetter documentation, it will take approximately 1 hour/kiln/day for kiln management.

17. Fixed Costs

In addition to the per charge and kiln time variable costs, there are some costs that are fixed and do not vary depending upon how many charges are put through or how long the cycles are. As indicated below, we estimate that the fixed costs will total about \$178,000 annually.

TABLE 3.5

ANNUAL COSTS AND GENERAL EXPENSES

<u>Cost Item</u>	<u>Amount</u>
Maintenance	\$7,700
Facility insurance	8,400
Depreciation	140,000
Electricity and Gas, fixed portion	225
Forklift	9,600
Telephone, Office and Miscellaneous	<u>12,075</u>
Total	<u><u>\$178,000</u></u>

The assumptions underlying these cost projections include:

- The maintenance expenses are comprised of boiler chemicals, kiln painting, mechanical checks and yard maintenance. The boiler chemical figures were estimated by a custom kiln operator, Rebco, at \$1,000/year. The cost of kiln painting was also estimated by Rebco, at \$4,000 for materials and \$3,400 for materials to be done every two years. Mechanical check costs were given by Custom Dry Kiln, the company that currently maintains Abeda's existing kilns, as \$1,000/kiln/year. Yard maintenance was simply estimated at \$1,000/year.
- Facilities insurance costs was estimated by Rebco to be \$700/month, if the facility did not have any remanufacturing facilities. Further clarification of insurance rates can be obtained from Rebco's insurance agent Jardine and Jardine in Victoria (250 388-4416)
- Depreciation was taken on the entire capital cost projection (including kilns, paving, the dry storage building, and construction/installation costs) at the class 8 rate of 20%.
- The fixed portion of electricity costs were given by BC Hydro at \$8.29/bi-monthly.

- The fixed portion of gas costs were given by BC Hydro at a basic rate of \$14.64/month.
- Forklift leasing costs are \$800/month for a new cat GP40, given by Finning Equipment. This costing was based on a 8,000 lb machine, used on average, less than 2 hours/day.

We have not included any financing charges in these estimates.

18. Prices to Be Charged

Of particular interest to the value-added manufacturers is the price that the proposed kiln operation would have to charge. The price has to be sufficient to:

- Cover the per charge costs and the kiln time costs;
- Contribute towards the fixed overhead costs; and
- Provide a return on capital, which could be used in part to pay for financing charges.

The price will vary depending upon the amount of time that the wood is in the kiln, which itself is a function of the moisture content when the wood enters the kiln and the target moisture content. It will also vary depending upon capacity utilization; if capacity utilization is low, the markup on per charge and kiln time costs has to be higher in order to cover the fixed overhead costs.

We developed the following table in order to demonstrate how the price per thousand board feet would vary depending upon the number of days in the kiln and the capacity utilization rates.

TABLE 3.6

**VARIATIONS IN REQUIRED PRICES PER THOUSAND BOARD FEET
BASED ON DAYS IN KILN AND AVERAGE CAPACITY UTILIZATION
(\$/mbf)**

Number of Days in Kiln	Capacity Utilization			
	70%	80%	90%	100%
3	\$79	\$74	\$70	\$67
5	\$112	\$103	\$97	\$92
10	\$194	\$177	\$164	\$154
15	\$276	\$251	\$231	\$216
30	\$522	\$472	\$433	\$402
36.5	\$628	\$568	\$520	\$483

As indicated, if the facility operated at 80% capacity over the course of the year, it would have to charge \$103 per thousand board feet for a five day load in order to cover variable and fixed costs and provide a return on capital. In developing this table, we assumed that the revenues would provide for a return on capital of \$70,000 as indicated below:

TABLE 3.7

**PROJECTED NET INCOME STATEMENT
ASSUMING 80% CAPACITY AND 5 DAY CHARGES**

Assumptions			
Capacity Utilization	80%		
Number of Days Per Charge	5		
Board Feet Dried Annually	4,155,160		
Average Price Per Thousand Board Feet	\$103.36		
	Dollars	Percent	Per Mbf
Revenue	\$429,464	100.0%	\$103.36
Per Charge and Kiln Time Charges			
Stickers Materials	55,655	13.0%	\$13.39
Kiln Time Energy	49,640	11.6%	\$11.95
Fork Lift Fuel	5,548	1.3%	\$1.34
Labour			
Stickers	51,918	12.1%	\$12.49
Forklift	3,679	0.9%	\$0.89
Kiln Management	14,600	3.4%	\$3.51
Miscellaneous	6,424	1.5%	\$1.55
	<u>187,464</u>	<u>43.7%</u>	<u>\$45.12</u>
Contribution Margin	\$242,000	56.3%	\$58.24
Fixed and General Expenses			
Maintenance	7,700	1.8%	\$1.85
Facility insurance	8,400	2.0%	\$2.02
Depreciation	140,000	32.6%	\$33.69
Electricity and Gas, fixed portion	225	0.1%	\$0.05
Forklift	9,600	2.2%	\$2.31
Telephone, Office and Miscellaneous	6,075	1.4%	\$1.46
	<u>172,000</u>	<u>40.0%</u>	<u>\$41.39</u>
Contribution Towards Capital	<u>\$70,000</u>	<u>16.3%</u>	<u>\$16.85</u>

If there were no capital financing costs and no return on capital expected, the operation could break even on prices that are 14% to 28% below those outlined in Table 3.6. The percentage savings increase with the time in kiln and decrease with the capacity utilization.

F. POTENTIAL SOURCES OF FINANCING

Potential sources of funding for the proposed kiln would include contributions from Forest Renewal BC, contributions from Human Resources Development Canada, debt financing, and funds contributed by Association members and others. Each of these potential sources is outlined in the following paragraphs.

19. Forest Renewal BC

FRBC does not currently have a program for infrastructure development. While it does have programs (described later in this section) through which small businesses in the forest sector can obtain financing at market rates, it does not deliver any grant or low/no interest loan programs. It has been argued that, if government really wants to support the development of the value-added sector (especially in areas such as the Peace), it will have to get involved in infrastructure development through a vehicle such as a lease to own program, a community initiatives program, a capital grant or repayable grant program, or government owned facilities. The wood kiln would appear to be an ideal infrastructure project in that it could be a cooperative venture that would benefit a wide range of users. However, while the Association should continue to encourage FRBC to develop such a program, it appears that the business plan will not be able to rely on this as a source of funding.

20. Human Resources Development Canada (HRDC)

There may be some funding available under the HRDC Transitional Job Fund. The Transitional Jobs Fund (TJF) is a three year initiative designed to support job creation activities in high unemployment areas of the country. Under the program, financial assistance may be obtained to cover wages, employment related costs, administrative costs, overhead, and capital costs.

Some of the key criteria used in determining if projects are eligible for funding include:

- More than 12% of the working age population must be receiving unemployment insurance payment or social assistance;
- The HRDC contribution cannot not exceed 50%of the project costs;
- The project must result in sustainable jobs. The target is \$20,000 per job, although the actual cost per job can be higher;
- The project must be consistent with local economic development objectives; and
- The project must be supported by the local Member of Parliament and by the Government of BC.

It was suggested by an HRDC representative that the likelihood of obtaining approval might be better if the business plan was funded, in part, under the HRDC Local Labour Market Partnerships program. In addition to the Transitional Job Funding Program, HRDC has programs which could offset a portion of the costs by providing funding to assist in hiring individuals who could work on constructing and operating the facility.

21. Debt Financing

In the absence of government financing, the kiln would have to be established through a mixture of equity and debt financing from a financial institution. FRBC has two programs to assist small businesses in the forest sector obtain debt financing including:

- This Forest Community Business Program is designed to diversify, stabilize and expand the economic and employment opportunities of forest-based communities by providing increased access to financing, business planning support, and training for small businesses in the forest sector. The financing segment of the program has been operational since June 1996, through community-based lenders such as Community Futures and Native Development Corporations (for loans up to \$75,000) and through credit unions (for loans of up to \$250,000). In February 1997, the corporation added the Business Development Bank of Canada as a lender in this program, for loans from \$75,000 to \$250,000. While this program does increase access to capital, the interest rates are high; for example, the interest rate charged under this program by the Community Futures office in Dawson Creek is prime plus 5%.
- Forest Renewal BC is in the process of developing the Value-added Finance Program, under which financing will be available for value-added through existing commercial lending institutions. Lending agencies for the program are to be identified in the summer of 1997.

However, the interest costs are likely to be less under a mixture of a mortgage, a Small Business Loan Agreement insured loan, and an operating loan from a bank. The Small Business Loans Program was created by the Government of Canada to help small businesses reach their potential by making it easier for them to get term business improvement loans - BIL - to finance the purchase or improvement of fixed assets for new or expanded operations. Most small businesses starting up or operating in Canada are eligible for SBLA loans, as long as their estimated annual gross revenues do not exceed \$5 million during the fiscal year in which they apply for a loan. Eligible businesses include professional practices but exclude farming and charitable or religious enterprises. Businesses may be sole proprietorships, partnerships or incorporated companies.

Under the SBLA, loan proceeds may be used to finance:

- The purchase of land, including any structures thereon required to operate the business (land loans);
- The renovation, improvement, modernization, extension, construction or purchase of premises (premises loans);
- The purchase, installation, renovation, improvement or modernization of new or used equipment (equipment loans).

However, loan proceeds cannot be used to purchase shares or other types of ownership in a business enterprise, acquire working capital (finance inventory, accounts receivable, etc.), pay off existing debt (unless the loan is used to refinance eligible fixed-asset purchases made or committed within 180 days of the loan approval date), purchase real estate for resale, or purchase or improve real estate for lease or sub-lease purposes (hospitality, health care and mini-storage industries are exempt from this exclusion).

The maximum value of loans a borrower may have outstanding under the SBLA cannot exceed \$250,000. Loan proceeds may be used to finance up to 90% of asset acquisition or asset improvement costs, subject to credit approval and at the discretion of the lender. Lenders are obligated to take security on the assets financed and on other business assets, as may be the case with land and premises loans made to tenants. The lender may take personal guarantees not exceeding, in aggregate, 25 percent of the original amount of the loan. These guarantees may not be secured with personal assets.

The period during which a loan must be repaid will generally coincide with the expected economic life of the asset being financed, up to a maximum of 10 years. Instalment payments on the loan principal must be scheduled at least annually, but monthly payments are usually called for depending upon arrangements between the borrower and the lender. Under the SBLA, borrowers may choose between:

- Floating-rate loans, where the interest rate fluctuates with changes in the lender's prime lending rate over the term of the loan, but cannot be more than 3% over the lender's prime lending rate; and
- Fixed-rate loans, where the interest rate is fixed for the term of the loan, but cannot be more than 3% over the lender's residential mortgage rate for the applicable term. This 3% includes an administration fee of 1.25% payable by the lender to the government annually.

Under the SBLA, lenders are required to pay a one-time loan registration fee to the government equal to 2% of the amount loaned. The fee is recoverable from borrowers who may reimburse the lenders when their loans are advanced or have the amount of the fee added to their loan balances, provided that the individual borrower's loan maximum of \$250,000 in total is not exceeded.

22. Private Funding

According to our discussion with bankers in the region, to be bankable in the absence of grant financing, the project will likely require confirmed contracts and an equity contribution of at least 25% of the total cost. The willingness and capacity to provide equity contributions varies across the Association membership. Many of the members will need whatever capital they have available to gear up to take advantage of the opportunities presented by the kiln.

If grant financing is provided, the kiln could be owned by the Association and either:

- Be operated directly by the Association, which would hire the staff and oversee operations; or
- Be operated by an organization or individual who is contracted by the Association to operate the kiln.

In both cases, the kiln would be operated in accordance with the policies established by the Association. However, if equity financing is required, the kiln would presumably be owned and operated by the businesses and/or individuals who contributed the money.

Another option to fund the facility may be to set up a Venture Capital Corporation (VCC) under the BC Ministry of Small Business Equity Capital Program. The purpose of the Equity Capital is to increase the availability of equity capital in British Columbia and assist business creation, expansion and preservation in "value-added" sectors of the provincial economy. Under the Equity Capital Program, the Government of British Columbia provides investors with a tax credit equal to 30% of their investment in a special holding company called a Venture Capital Corporation (VCC). The maximum credit for an individual is \$60,000 per year. If the amount of the credit exceeds \$60,000, any excess may be carried forward for the next four taxation years. A corporate investor may deduct the tax credit against provincial taxes without limit. However, a corporation is not entitled to a refund if the amount of the tax credit exceeds the amount of tax otherwise payable under the

B.C. Income Tax Act.

To obtain registration under the Equity Capital Program, the VCC must, among other things, raise at least \$25,000 of equity capital prior to applying for registration and have at least \$50,00 of equity capital within one year of registration. The target businesses for the VCC investment, which in this case would be the custom kiln operation, must:

- Be "substantially engaged" in an activity involving import replacement, export enhancement or economic diversification;
- Pay at least 75% of wages and salaries to employees who regularly report to work at operations located in British Columbia;
- Employ not more than the equivalent of 75 full-time employees at the time of investment.
- Have a permanent establishment in British Columbia and file its incomes tax returns as such.

The proposed kiln operation should not have trouble meeting these requirements. However, the VCC together with related parties and other VCCs must not control the small business; this means that at least 50% of the shares would have to be held outside of the VCC. The program allows eligible small businesses (ESBs) to use VCC funds for capital expenditures and working capital. The funds cannot normally be used for lending, purchasing securities, acquiring land, entering into non-arm's-length transactions or investing outside of British Columbia.

IV. POTENTIAL ECONOMIC IMPACT OF THE PROPOSED KILN OPERATION

The potential economic impact of the proposed kiln operation goes well beyond the economic activity that would be generated at the facility itself and, in fact, is directly tied to its ability to promote further development of the value-added wood industry in the Peace. This chapter reviews the potential for development. In this chapter, we focus primarily on the aspen hardwood resource because it is underutilized, because the Association members indicated that it is of greatest interest to them, and because the softwood markets are already well defined. Nevertheless, much of the market information presented here is applicable to both hardwoods and softwoods.

More specifically, this chapter reviews the characteristics of the hardwood resource and the patterns of development that have occurred in other jurisdictions, conducts a preliminary review of a number of potential products and markets, summarizes the opportunities and constraints to development, and assesses the potential economic impact.

A. CHARACTERISTICS OF THE HARDWOOD RESOURCE

The following paragraphs provide a description of aspen and compare it to other woods.

1. Description of Aspen

Table 4.1 outlines the location of the aspen resource in Canada. As indicated, the commercial aspen resource occurs in a band that runs from northeastern BC to southwestern Ontario and then across to Quebec. The map also indicates the annual allowable cut in each jurisdiction, as of 1989. The aspen resource in Canada is often referred to as “huge and hidden” in that we have five times as much aspen as the United States and historically have utilized half as much. According to one report, aspen comprises about 11% (almost 3 billion cubic metres) of Canada’s forest resource; however, at least as of 1986, we were utilizing less than one-tenth of the Annual Allowable Cut.

Some characteristics of aspen as a wood include:

- It is generally referred to as a low cost material;
- Aspen is not as strong as other hardwoods such as oak or birch. As a result, it is often referred to as a soft hardwood or lower density hardwood. For example, aspen deck boards have to be 33% thicker than oak or birch.
- Aspen is generally a small diameter tree. Larger, more mature, trees are not necessarily better because they have a greater tendency for rot;
- The wood tends to contain many knots, mostly of which are tight;
- It is normally white, although discolouration is frequent in mature and over-mature trees;
- Aspen decays easily and the external appearance of the tree can be deceiving;
- It is odorless (when dried), splinterless/sliverless, and very absorbent when dry;

- The heartwood is difficult to dry and wet pockets occur. It is common to use the outer layers of the wood and chip or pulp the inside. One company we interviewed claimed to have a 70% utilization rate. This rate was obtained via a process of seasoning/conditioning, air drying and kiln drying (5 days at 140 degrees).

With the exception of screw holding, aspen is considered to have “good usability” as outlined below:

- Aspen is light weight (416kg/m³ or 26 lb/ft³) when air dried;
- Aspen is a tough (when green it is equal to douglas fir when dry it is equal to yellow pine);
- Aspen nails without splitting, even at the ends of the board;
- Aspen glues and embosses well;
- Aspen wears smooth; and
- Aspen machines easily.

Some of the particular challenges with aspen include:

- Aspen is more difficult to dry than softwoods. Aspen has wet pockets, a tendency to collapse, and to warp and cup during drying;
- The characteristics of the wood make aspen unsuitable for stress points, thereby requiring either different species to be used for the joints or the aspen to be laminated;
- Cutting aspen can be difficult, it is full of knots and extra sharp knives are required to avoid a fuzzy surface appearance;
- Painting aspen is more expensive, it is very absorbent and requires more sealer and paint. Also aspen stains unevenly;
- Aspen is not as widely known as other woods. Manufacturers who are familiar with working with softwoods have to learn how to utilize the wood correctly and customers may not be familiar with aspen.

2. Substitute Products

The choice of using aspen for a value-added product can be attributable to price, availability and substitution. For example, lower cost woods can be substitutes for higher cost woods, readily available species of wood can be substitutes for less immediately available species of woods, veneers can be substitutes for solid woods, and other materials, such as MDF or plastics (PVC), can be substitutes for wood.

Aspen is frequently a lower price substitute for more expensive lighter woods such as birch. Depending on availability, aspen is often considered interchangeable with bass wood, poplar, or alder. In turn, it is also common for MDF or yellow pine to be lower price substitutes for aspen.

- The next entrant into the aspen utilization schemes are pallet, crate and box producers. This kind of operation, such as Sunchild in Alberta, also require substantial amounts of aspen; however, now the aspen is being differentiated. Very low quality wood is still being pulped or chipped and the other useable aspen is being graded³ with the lower grades made into pallet, crate or box products and higher grades being used to provide higher value products.
- Finally, smaller companies begin producing higher value-added products, primarily for the local market.

When each of these kinds of companies becomes established, the available resource is fully utilized, and the value-added aspen sector is said to have reached maturity. At maturity, the resources of aspen timber can become strained, the availability of fibre can decrease dramatically and short falls may begin to appear, prices start to increase and substitution, either with more available species or lower cost available species, begins. The time that elapsed from first efforts to a mature aspen value-added sector in Wisconsin took approximately 10 years.

Table 4.3 depicts the market cycle for aspen. Referring to this Table 4.3, BC would currently be positioned at the end of the introduction cycle at the early stage of development. In BC we are beginning to differentiate between the resource in order to produce increasingly higher value products. As indicated in Table 4.4, the stage of aspen value-added development in North America varies widely by region. Saskatchewan is in the very early stage of development while US states such as Wisconsin and Michigan are at the mature stage, and Colorado is in decline.

TABLE 4.4

STAGE OF ASPEN VALUE-ADDED DEVELOPMENT IN SELECTED REGIONS

Location	Stages of Development	Aspen Utilization
Saskatchewan	virtually no development	contemplating
British Columbia	small pockets of development	exploring
Alberta	initiated development of sector	researched
Ontario	exponential growth region	researched
Central US Wisconsin, Indiana Dakota, Michigan	mature region	managed
Colorado	declining region	managed

³ In the States, aspen is separated into four grades depending on the amount of clear wood.

3. Types of Smaller Value-added Aspen Companies

Smaller value-added aspen manufacturers from other jurisdictions can be classified into three different types:

- **Retail/wholesale companies**, which make final aspen products for sale to the end customers. These companies typically have a few core products with a limited number of styling options, a showroom location and sales agents who call on wholesale accounts. Buyers are drawn from a 200 - 500 mile radius.

An example of this kind of company is August Lotz in Boyd, Wisconsin. August Lotz makes entertainment centers, chairs and bed frames out of aspen. The bed frames are either platform frames or futon frames. The platform bed frames come in two styles and the futon frames come in four styles. They have a showroom in Boyd which sells direct to the public and they send sales agents to call on major hotel accounts. Buyers are drawn 95% from the US and 5% from Canada.

- **Business to Business companies**, which make intermediate aspen products and ship them to another company for further processing. This type of operation is called a "two step operation". A two step operation is two steps away from the end customer. The intermediate aspen products can be either be component parts or "instrument type" items to be used in preparation of final products. Business to business companies make a select line of products that are custom made to the buyers' specified measurements. Buyers are typically drawn from a 300 mile radius.

An example of this kind of company is Owen Manufacturing in Owen, Wisconsin. This company's line of products are contract goods, patio furniture and accessories and bathroom and kitchen goods. Items made to buyers' specifications include:

- Cheese boxes, a contract item;
- Slats for grill handles and patio furniture, a patio furniture and accessory item; and
- Pizza peels, a bathroom and kitchen item.

This company has a retail outlet for their oak goods and sales agents who arrange the custom intermediate aspen product orders. Buyers are drawn from Michigan, Indiana, Illinois, Minnesota, Ohio, Iowa, and the Dakotas.

- **Distributor focused companies**, which make primary aspen products that are purchased by the end customer, retail/wholesale companies and business to business companies. This type of company may be one, two or three steps away from the end customer. One step would be if the end customer came and bought wood that was to be used in a do-it-yourself style room redecoration. Two steps would be if the retailer bought wood to be used as styling items in the bed frames. Three steps would be if the dried aspen wood was purchased as a part to be incorporated into an intermediate product, such as a fireplace mantel. Aspen primary products can be the green timber, kiln dried lumber, and millwork items. These distributor companies have yards or wood lots. Buyers are drawn from 150 to 300 mile radius.

An example of this kind of company is Kettle Marine Hardwoods in Slinger, Wisconsin. It sells green and kiln dried aspen. This company considers itself a middleman and has set up a yard which is open to everyone. Buyers are drawn from a radius of 150 miles.

Table 4.5 illustrates the interconnected relationships between these smaller aspen utilizers. This diagram shows the processing flow of aspen from the green timber to the end customer. As indicated, dried aspen can be directly shipped to companies for processing into final products or it can be shipped a number of times before being processed into a final product. The value of an aspen product increases as it moves closer to the end customer.

4. Products and Markets

As indicated in Table 4.6*, aspen can be used in a wide variety of primary, intermediate, and final product applications. As in any product, the characteristics of aspen can affect its usefulness or desirability for certain applications.

TABLE 4.7

EXAMPLE OF VARIOUS APPLICATIONS FOR ASPEN

Product	Characteristic
Paneling	attractiveness, wears smooth, low weight
Crates and boxes	good toughness, availability, wears smoothly, low weight
Broom handles	splinterless
Toys (puzzles, blocks)	splinterless and embosses well
Seats, unfinished	splinterless
Tongue depressors	splinterless and tasteless
Glued up stock	glues well

The abundance of supply and the quality of the supply also affects its use. For example, lower quality aspen can be used for pallets and boxes, crates, and coral rail or it can be painted and used for cheaper moldings. Alternatively, lower quality aspen could be concealed and used for applications such as door blanks. Higher quality fibre tends to be used for higher-value applications such as moldings or furniture.

While almost any product that can be made out of wood can be made out of aspen, experience in other jurisdictions indicates that certain types of value-added products are more likely than others to utilize aspen. Some of the more common applications for aspen include:

- Value-added product components;
- Furniture products;
- Flooring;
- Windows, Doors and Molding;
- Cabinets;
- Pallets and wooden boxes; and
- Other products including paneling.

An in-depth assessment of these markets was beyond the scope of this study. However, based upon secondary information and a limited number of interviews with industry representatives, we have prepared a

* Please see Appendices

brief overview of these markets which is provided in the following paragraphs.

5. Value-added Wood Component Products

Value-added products can use aspen in solid wood form, as a fibre input for plywoods, OSBs and particle boards, or as part of a laminate. According to industry sources, in the future, laminates will be the preferred material for furniture, cabinetry and flooring products. However, currently in North America, solid wood is still used for the majority of value-added products. As indicated in table 4.8, hardwoods still comprise almost one-half of the raw material used in furniture.

TABLE 4.8

MATERIAL USED IN THE CONSTRUCTION OF FURNITURE

Type of Construction	Percentage
Solid hardwood	45%
Artificial laminates over composites or softwoods	26%
Hardwood veneers over composite or softwoods	17%
Solid softwood	8 %
Other construction type	4%
Total	100%

While there is information on the size of the end furniture market, door market, and other final product markets, there is very little information on the size of the component market because of the way that statistics are classified. However, the size of the market appears to be large. One industry source indicated that 10% to 15% of furniture manufacturers purchase relatively large volumes of component parts to incorporate into their products. The value of wood components purchased could be significant given that the wood purchases of North American wood furniture manufacturers total about \$4 billion each year. According to Dun and Bradstreet statistics, the sales of the 440 US companies that specialize in the sale of hardwood furniture stock and parts, hardwood frames for upholstered furniture, and hardwood blocks, blanks and squares totaled \$461 million last year.

From the perspective of finished good manufacturers, the advantages of purchasing components rather than manufacturing their own are said to include:

- Suppliers providing standard products to a range of finished product manufacturers can achieve economies of scales that would not be open to the finished product manufacturers themselves;
- The suppliers can specialize in the products, which can work to enhance the quality of the products produced;
- Using the services of a supplier for certain component parts can reduce the level of investment, the amount of staff training, the number of staff, and the amount of inventory required by the finished product manufacturer.

Our research identified examples where aspen has been used in component products:

- Upholstered furniture companies use a lot of aspen in frames typically conceal the aspen part of the frame and use other woods at the stress points. In Wisconsin, there are futon frame manufacturers that use mainly aspen in their frames and use oak for the stress points.
- A door manufacturer in the Lower Mainland, A-1 Doors, expressed interest in purchasing 1,500 to 2,000 board feet per week of aspen or poplar door blanks. However, it should be noted that an aspen manufacturer in another jurisdiction indicated that “we began our business by making door blanks out of aspen. Then the MDF, OSB and plywood companies started to make door blanks and we couldn’t compete, so we got out of it.”
- One US company surveyed, which installs custom kitchens, used to use aspen as an underlay for the countertops which they would cover with Formica. “We stopped using aspen in countertops because the price got too high, the quality was poor, there were too many knots and the wood was fuzzy when cut. Also aspen is soft and porous and it takes a lot of sealer and it is hard to paint.”

Examples of some companies that have been involved in component production include:

Company: Peace Wood Products
Location: Taylor, BC
Products: Aspen studs and furniture stock
Produced various products including aspen studs in 1983 and ceased production in the same year due to lack of markets.

Company: South East Forest Products Ltd.
Location: Sprague, Manitoba
Products: Processed aspen
Used to process some aspen but stopped. They believed that markets for green aspen “just don’t exist.” The company ceased operations in 1992. It was closed and the equipment was moved off the premises. It is still, however, owned by A.K. Penner of Blumenort, Manitoba, he also operates a lumber yard called Steinbach.

Company: Jasper Millworks Ltd.
Location: Edmonton
Products: Processes aspen, furniture components and edge glued panels. Jasper Millworks Ltd. remanufactures aspen, fir and lodgepole pine which is purchased from Alberta and BC. The company kiln dries the wood and makes a product line of furniture components and edge glued panels. They market the products locally, with some of the production is going to Europe and Pacific Rim through brokers.

Company: Norvik Timber Company Ltd.
Location: Delta
Products: Process and dry alder for furniture stock. The wood is exported to the US. This company ceased operations.

Company: Finmac Lumber Ltd.
Location: Winnipeg
Products: Processes aspen and birch for furniture framing.

6. Furniture

According to the American Furniture Manufacturers Association, the value of the American furniture market will be \$21.1 billion in 1997.

TABLE 4.9

**PROJECTED SIZE OF THE US FURNITURE MARKET, 1997
FURNITURE SHIPMENT VALUES**

Type of furniture	1997 Value, in billions of US Dollars	Percentage
Wood	10.3	49%
Upholstered	8.3	39%
Metal and other	2.5	12%
Total	21.1	100%

Source: American Furniture Manufacturers Association

As indicated, wood furniture accounts for almost one-half of the value of furniture made in the States.

US domestic furniture production has not been able to keep up with growing sales demand and, consequently, the value of imports has been increasing sharply. In 1994, the largest exporter of furniture to the US was Taiwan which exported \$1.75 US billion worth of products. The second largest exporter was Canada, which exported \$845 million US worth of products to the United States. As was noted in Table 2.17 in Chapter II, the value of wood furniture exported through British Columbia increased from \$22.5 million in 1992 (of which 86% was destined to the US) to \$58.7 million in 1996 (of which 85% was destined to the US).

The size of the Canadian wooden furniture industry is about \$2.2 billion, based on retail sales rather than manufacturer shipments. The 10.5 million households in Canada spent \$5.2 billion on furniture in 1994, equal to about \$500 per household. Wooden furniture accounted for about 43% of the value of furniture sold in Canada. Forty wooden furniture manufacturers in BC produced about \$103.7 million of wooden furniture in 1994. BC production represents less than 10% of the \$1.1 billion of wooden furniture produced in Canada in 1994.

According to the American Furniture Manufacturers Association, when comparing 1996 with 1997 furniture shipment dollar values, the whole furniture market is expected to increase 5.7% while residential wood furniture is expected to increase 5.9% and office furniture is expected to increase by 5.4%. It is also projected that growth will continue into 1998, with the furniture market reaching \$22.1 billion, the residential wood market reaching \$10.78 billion, and the office furniture reaching \$10.45 billion. Industry sources indicated that the greatest increases in demand currently are for wooden bedroom furniture, solid wood furniture, and ready to assemble furniture. According to one aspen value-added operator "a hot item is occasional chairs ... major furniture chains want quick selling items ... occasional chairs are great for this especially Queen Annes, swivels or swivel rockers ... a really hot item that we are not making and wish we were is the glider rocker ... a rocking chair that glides back and forth with no rocking or turning capability ... I expect that you could sell it to a major chain for about \$89 US".

This optimism is corroborated in a recent US survey of the top 25 residential furniture manufacturers.

TABLE 4.10

**PERCEIVED BUSINESS PROSPECTS AMONG
U.S. FURNITURE MANUFACTURERS**

Furniture Manufacturers	1997	1996
Business prospects		
Best Ever	11%	25%
Very Good	39%	25%
OK	50%	45%
Poor		5%

Source: Wood and Wood Products

Most furniture manufacturers produce a range of products. A US study found that, on average, furniture companies were making at least seven kinds of products. An interesting finding of this study was that the number of products produced tended to decrease as the size of the company increased; in other words, larger companies were more likely than smaller companies to specialize in specific product groups. As indicated in table 4.11, more furniture companies tend to produce bedroom furniture, dining room furniture and occasional tables and chairs.

TABLE 4.11

**PERCENTAGE OF COMPANIES PRODUCING SELECTED
TYPES OF PRODUCTS**

Type of Furniture Products	Percentage of Companies Making the Furniture Product
Bedroom furniture	67%
Dining room	65%
Occasional tables & chairs	54%
Entertainment centers	48%
Living room	47%
Home office	38%
Kitchen	36%

According to Dun and Bradstreet data, companies that specialize in particular types of wooden furniture products have 43 employees on average while companies that produce a wide range of products have, on average, 24 employees.

Other characteristics of the wooden furniture industry include:

- Manufacturers of wooden household furniture are the largest utilizers of hardwood lumber. It is estimated that the US wooden furniture industry used 1.2 Bbf of hardwood in 1991 while manufacturers of upholstered furniture utilized 1.1 Bbf.
- Hardwoods account for about 75% of solid wood purchases by US wooden furniture manufacturers. Oak accounts for about 46% of total hardwood consumption. Other commonly used species are yellow poplar (11%), soft maple (9%), black cherry (7%) and hard maple (6%).
- The US furniture market is fairly concentrated with 25 firms accounting for 51% of the sales in 1996. Many of the large manufacturers are realizing large gains in annual sales. For example, Ashley Furniture revenues were up 19%, Hooker Furniture revenues were up 12%, Sauder Woodworking revenues were up 9% and Flexsteel Industries revenues were up 9%. The biggest US furniture producer is LifeStyle Furniture International (formerly Masco Home Furnishing Group) with sales of \$2.1 billion in 1996, up 5% from 1995.
- There are about 4,000 wooden household furniture manufacturers in the United States, of which one-half have under five employees.
- The average wooden furniture manufacturer in BC has 25 employees. The size of furniture producers range from single person operations to larger companies. The largest Canadian furniture producers are based in Quebec, Ontario and Manitoba.
- The retail furniture market has become very competitive. This competition is reflected in pricing and costing levels, the consolidation of retail outlets and the adoption of aggressive sales techniques.

As evidenced by the product line of North Country Creations in Fort St. John, a wide variety of wooden furniture products can be produced using aspen. The results of our interviews indicate that:

- There is an operation in Michigan that has produces ready to assemble (RTA) furniture from aspen for distribution by KMART throughout the United States. Making RTA furniture requires wood to be 3/8 or 1/2 inch thick, with lengths varying according to the furniture design. Pieces are then laminated using conventional gluing techniques. It has been estimated that RTA constitutes 10% to 15% of the wooden furniture market.
- Properties of aspen make it highly suitable for children's furniture. Favorable properties include its "clean" almost white appearance, good gluing and screw holding properties and favorable splintering characteristics; it does not splinter easily and, when it does, it forms only long dull pieces.

In Alberta, extensive research inclusive of a test operation was undertaken regarding juvenile furniture. The furniture was made by H.P.C. Construction and went by the brand name of Northland Childrens Furniture. The product line consisted of cribs, change tables, change commodes, high chairs and toy boxes. The products were all well received at trade shows. Distribution was secured through children's shops in Calgary, Vancouver, Grand Prairie and the Pacific North West and the US.

- Stork Craft Ltd. makes primarily baby cribs from softwoods and hardwoods.

- Aspen is valued because of its appearance, which differentiate its from softwoods and other hardwoods, as well as its strength to weight ratio. Its disadvantages are that it is not well known by consumers or manufacturers.
- Aspen is considered to be one of the more difficult woods to process into products. In addition, when converting aspen lumber into products there is a greater amount of wastage. One US study estimated the following yields for aspen, as defined as the amount of wood required to make 1000 board feet of furniture parts.

TABLE 4.12

**ESTIMATED YIELDS FOR FURNITURE PARTS
MANUFACTURED FROM ASPEN**

Lumber to Make 1000 bf of Furniture Parts	Common #1 grade lumber, in bf	Common #2 grade lumber, in bf
Rough lumber	2,085	3,324
After drying & rough mill manufactured	1,960	3,125
Furniture parts	1,000	1,000
Yield	51 %	32%

According to that study, when comparing processing of common #1 grade stock, aspen, hard maple and red oak all have a 51% yield. However, when processing common #2 grade stock, the yield for aspen is 32% as compared to 42% for maple and oak. The yield for common #2 grade stock is lower for aspen because it is more difficult process into furniture parts and creates more wastage. Actual yields would vary depending upon the quality of the fibre, the application, and the experience and expertise of the manufacturer.

A list of some of the furniture producers in Western Canada which have developed wooden furniture products based on local hardwood lumber includes:

Company: Gregg's Furniture
Location: Victoria
Products: Upholstery furniture out of spruce and maple.

Company: Parkland Furniture Manufacturing
Location: La Combe, Alberta
Products: Furniture frames and some upholstery furniture. In the past they have purchased 40 Mbf per month of alder from a Washington mill. This company ceased operations.

Company: Hartshorn Manufacturing
Location: Edmonton
Products: Furniture frames for Kroehler and Turwa Design. They use a mixture of birch, elm, maple, ash and oak. This company ceased operations.

Company: Craft Built Furniture Manufacturing Ltd.
Location: Edmonton
Products: Upholstery furniture including products using aspen and birch. This company ceased operation in 1995.

Company: Homestead Furniture Factory
Location: Saskatoon
Products: Upholstery and solid wood furniture using pine and birch. This company ceased operations in 1997.

Company: Edmonton Furniture Upholsters
Location: Edmonton
Products: Furniture frames, beds and head board using spruce plywood, and, alder and maple framing stock.

Company: Top Choice Woodworking
Location: Winnipeg
Products: Furniture frames and solid wood chairs using oak and birch. This company ceased operations.

Company: Birchwood Furniture Ltd.
Location: Calgary
Products: Upholstery furniture using alder purchased in Montana.

Company: Sealy Canada Ltd.
Location: Edmonton
Products: Mattress box frames utilizing some aspen. They make the frames from components parts which are cut to specifications. They use common grade 3 and 4.

Company: Tracey's Wood Products
Location: Spruce Grove, Alberta
Products: Mattress box frames using spruce.

Company: Palliser Furniture
Location: Winnipeg (5 operations) & Airdrie, Alberta (one operation)
Products: They make case goods, bedroom suites, leather and designer chairs, and "motion" upholstered furniture using aspen, birch, spruce and oak. They purchase 1" aspen stock in 4" 5" 6" widths and 8' in length with a 12% moisture content from Deer River, Michigan, Manitoba and Northern Saskatchewan. They have acquired timber licenses in Manitoba for aspen and birch and are doing their own logging. The logs are custom drawn and sawn in Winnipeg with the down grade material being chipped by a company owned OSB plant in Fargo, North Dakota. The company has been in operation over 15 years.

Company: Regal Furniture Ltd.
Location: Winnipeg
Products: Upholstered furniture using kiln dried birch and frame grade kiln dried aspen, spruce and lodgepole pine. They have the frame stock sent shipped precut into the correct widths and they cut it into lengths. They make three lines of sofas, beds and love seats. A high end line is called Wesley Manor, a middle line is called the Regal Line and the lower end line is called Elmcrest. The production manager of Regal Furniture commented very positively about aspen. He said the company had been using aspen for 21 years and actually preferred it over pine. "It is stronger than pine and it is lighter for freight."

Company: Carlton House
Location: Calgary
Products: Upholstered furniture, using birch and alder for framing materials and alder.

The amount of aspen and birch purchased by these companies ranges from less than 1,000 board feet per month to over 100,000 board feet per month.

7. Flooring

Our interviews with industry and government representatives indicated that aspen has been used for hardwood flooring. There has been an upsurge in the market for hardwood flooring in recent years. In the United States, there are about 220 hardwood dimension and flooring mills and 144 hardwood flooring manufacturers. These companies generate sales of about \$1.4 billion annually, most of which is from hardwood flooring. Hardwood flooring companies tend to be comparatively large, with an average of 59 employees and sales of about \$10 million annually.

Based upon the rate of new home construction, the American flooring market has been estimated at 330 million square feet (21 million square metres) per year. Using this same methodology, the size of the BC market for hardwood flooring in BC can be estimated to be about 200,000 cubic metres; this volume would represent sales of over \$100 million annually.

While the potential market for hardwood flooring is large, particularly in the Lower Mainland, two concerns about the use of aspen for this application are that:

- It is a relatively soft hardwood, which means it is not as durable a product as other hardwoods; and
- The difficulties in staining reduce its versatility.

Birch is generally considered to be a better wood for this application. Aspen could be used as a backing in a laminated flooring product. Laminated flooring products are cross laminated panels with a softwood or hardwood veneer back and core and a face of decorative hardwood. Currently laminated wood flooring products are gaining popularity in Europe and Japan. In BC, laminated wood flooring products are imported from the Southern States, Europe and Asia.

A sample list of some hardwood flooring producers in Western Canada includes:

Company: Signature Wood Floors
Location: Penticton
Product: Flooring, using maple and fir plywood or medium density board (mdf). They manufacture laminated flooring by gluing imported maple, oak and cherry on local fir plywood or mdf.

Company: Bill Smith Forest Products
Location: Chemainus
Product: Flooring and solid wood planks (5% of products sold), using small quantities of alder and maple for flooring and fir for the solid planks. They also make fingerjoint and laminated products and ready lumber for export to Japan.

Company: Stylus Flooring & Wood Products
Location: Penticton
Product: Laminated flooring, using oak veneer on plywood. They ceased operations.

Company: Columbia Birchwood Products
Location: Chase, BC
Product: Solid wood planks, using birch

Company: Moberly Wood Products Ltd.
Location: Golden, BC
Product: Flooring

Company: Syncra Wood Products
Location: McBride
Product: Flooring, moldings and paneling. For moldings they use fir and lodgepole pine. For the paneling they use pine, aspen, fir and cedar. They had one load of birch flooring sent to Germany and one to Japan.

8. Window & Doors

According to Statistics Canada, there were 47 firms in BC producing wooden doors and windows in 1994. These 47 firms generated about \$210 million in revenues from goods of their own manufacture and employed 1,479 people. The value of BC production represents about 18% of the \$1.17 billion in value produced in Canada in 1994. As was noted in Table 2.17 in Chapter II, the value of wood doors and windows exported through British Columbia increased from \$14.5 million in 1992 (of which 79% was destined to the US) to \$33.1 million in 1996 (of which 76% was destined to the US).

Windows are among the more complicated millwork items to manufacture due to variety of styles many small parts. According to one report, wooden window sales in the US is estimated to be 15 million units annually, with 2/3 being installed in new construction and 1/3 being installed as part of remodeling projects. The market share held by wood windows has declined markedly over the years, although interest in wood windows has increased somewhat over the past few years.

Wood is used as door framing stock, as core stock or for whole doors structure. The main substitute for wood doors is steel or aluminum doors. There are many types of interior and exterior doors used for entryways, passageways, closets, rooms and other functions. The most common types are:

- **Hollow core doors**, which consist of two vertical stiles, three horizontal rails and a lockblock. A lockblock is a block or center rail that allows for placement of the door handle and locks. The core piece is faced with door skins which may be made of two plywood or flat molded hardboards. Stiles and rails may be solid wood or they may be made of medium density fibreboard (mdf).

According to a US study, 38 million hollow core doors, 50% having hardwood faces, were installed in the US in 1989. These doors required about 125 million bft of lumber. The doors were produced at 96 hollow core door operations and controlled by about 70 producers. The demand for hollow core doors is largely dependent on residential construction; there is approximately 14 doors per new dwelling.

Typical sizes are:

Stiles: 1 ½" wide, 1 1/8" or 1 1/4" thick, 80 5/8" long
Rails: 1 3/16" wide, 1 2/8" or 1 1/4" thick 22', 26', 28', 30', 34' long
Lockblocks: 1 1/4" x 2 5/8" x 16" long

- **Solid Core Doors.** Cores can be made from particle board, mineral composition or wood block. The faces tend to be high value plywood. In 1989, in the US, there were 8 million solid core doors installed. Solid core doors are larger than hollow core doors. The dimensions are typically 36" wide, 6'8" high and 1 3/4" thick, requiring 6 bdft of lumber per door.
- **Wood panel doors** are primarily exterior residential doors. Most exterior doors in the US are

made by 6 or 7 western producers using Douglas fir, hemlock and white fir. Interior panel doors are mostly made from pine in the Mid West or Southern US. In 1989, 8.6 million panel doors were installed of which 5 million were fir and hemlock and 3.6 million were pine. Each door requires 40 bft.

- **Garage Doors.** In 1989, 1.2 million wooden garage doors were installed in the States. Each wooden door requires about 65 bft of wood which translates into 160 million bft used in garage door construction. Traditional garage doors are made of wood, typically Douglas fir and hemlock; however, the market share held by wood has been eroded by steel, aluminum and fiberglass constructions.

Overall, little hardwood has been used in the manufacture of windows, doors and moldings in BC. However, according to one report, BC Millwork Products in Vancouver has manufactured interior doors out of maple, birch and other hardwoods.

9. Moldings

There were 54 firms in BC producing other types of millwork, most notably moldings and flooring, in 1994. These 54 firms generated about \$225 million in revenues from goods of their own manufacture and employ 1,631 people. The value of BC production represents about 20% of the \$1.13 billion in value produced in Canada in 1994. In the United States, there are about 6,000 firms active producing millwork; these companies generated revenues of about \$25.5 billion from all sources.

Moldings are functional and decorative. Functionally, they overcome deficiencies such as gaps or unevenly applied paneling. As a decoration, they add to appearance. There are 350 profiles or patterns of moldings according to the Wood Molding and Millwork Manufacturers' s Association.

Moldings are easy to make requiring no more than molders with the appropriate heads and tooling. Softwood moldings are usually made from clear pine. Moldings are produced in two grades, stain and paint, and are sold in standard bundles in lengths of 8' and 20'. Hardwood moldings are manufactured mostly from red oak and are stain grades. Some manufacturers in the Eastern US manufacture moldings from poplar, which may be painted or stained.

A disadvantage of aspen moldings is in regard to difficulties when painting and especially when staining. Nevertheless, one company surveyed makes 1 million lineal feet a month of molding from aspen.

Moldings are sold to retailers and large contractors as well as manufacturers who make furniture, cabinets and picture frames. A list of some molding manufacturers that have used hardwoods include:

Company: Vintage Woodworks
Location: Victoria
Products: They make anything for pre- 1950's homes or buildings. They make windows, doors, molding, millwork and spindles using alder, maple, oak, fir and cedar.

Company: BWP Millwork
Location: Armstrong
Products: Custom orders. They make moldings, doors and flooring out of birch, maple, oak, cherry and alder.

Another US company representative mentioned that very specialized niche products are hot like their Venetian blinds made out of aspen.

10. Cabinets

According to Statistics Canada, there were 83 firms in BC producing kitchen cabinets and bathroom vanities in 1994. These 83 firms generated about \$168 million in revenues from goods of their own manufacture and employed 1,759 people. The value of BC production represents about 18% of the \$937 million in value produced in Canada in 1994. As was noted in Table 2.17 in Chapter II, the value of wood kitchen cabinets and bathroom vanities exported through British Columbia increased from \$5.2 million in 1992 (of which 85% was destined to the US) to \$11.0 million in 1996 (of which 74% was destined to the US).

In the United States, there are about 5,300 firms active producing wood kitchen cabinets; these companies generated revenues of about \$5.7 billion from all sources.

There are three types of cabinets:

- Stock cabinets;
- Semi custom cabinets; and
- Custom cabinets.

Stock cabinets sold to home centers and semi custom and custom cabinets are sold through contractors.

In the US, 1997 shipments of kitchen cabinets and bathroom vanities are flat. However, double digit increases have occurred from 1992 through to 1995. In 1996, 74 million units were distributed⁴, with approximately 3 out of every 4 cabinets sold being used in remodeling projects. According to another source⁵ there were 54.8 million cabinets used in remodeling projects and 19.2 million cabinets used in new construction projects, in 1996. Predictions are for a slight increase in demand, up .9% to 55.3 million cabinets, for remodeling projects in 1997; for new construction projects, predictions are indicating a decline, down 2% to 18.8 million cabinets. The industry is characterized by a few larger manufacturers and many small manufacturers, 80% of the manufacturers have nine or fewer employees while less than 1% have over 250 or more employees. According

⁴US Kitchen Cabinet Manufacturers Association

⁵FW Dodge & McGraw

to an annual survey, the large cabinetry companies are still experiencing growth⁶. Characteristics of the 25 largest cabinetry companies in the United States in 1996 are indicated below:

⁶Wood & Wood Products tenth annual survey of the US Cabinet Industry, 1997.

- They had \$3.4 billion in sales;
- They held a share of 52%, or \$1.36 billion worth, of cabinetry put into new construction projects;
- 28% of their cabinets were frameless, up 15% from the previous year
- 26% of their cabinets were sold through home centers, up 9% from the previous year;
- 91% indicated that their business prospects were either the best ever or very good for 1997, as compared to 56% in 1996.

The biggest worry mentioned by representatives of the large cabinetry companies is wood supply and prices.

In Western Canada, it is estimated that there are over 400 firms that make kitchen and bathroom cabinets; however, there are only about 10 who are "major manufacturers" which employ over 20 people. The primary raw materials used by cabinet makers in Western Canada are oak, presurfaced plywood and particle board framing. Drawer guides are often made of pine or alder. Most of the materials for the cabinet trade are acquired through brokers and the larger cabinetry producers distribute through the major home centers.

Examples of some of the major cabinet producers include:

- Company: Kohler Company
Location: Wisconsin
Products: Cabinetry. In 1996 they acquired Canac kitchens of Thorn Hill Ontario

- Company: Jasper Millworks Ltd., Cabinetry Division
Location: Edmonton
Products: Cabinetry

- Company: Kitchen Craft of Canada
Location: Winnipeg
Products: Cabinetry using maple, oak, cherry, pine and hickory. The drawer parts are made out of aspen. In 1996 they build a 45,000 sq ft addition to existing plant.

- Company: Norcraft Companies, US
Performed well, 11% sales increase over 1995.

- Company: Texwood Industries, cabinet division, US
Performed well, 17% sales increase over 1995.

- Company: Elkay Manufacturing Company, cabinet group, US
Acquired Mastercraft Cabinets in 1996 and increased sales by 28%.

11. Paneling

Aspen could also be used for decorative or structural paneling.

- Decorative paneling can be made out of composite products or solid wood. Decorative paneling is used for accent wall, ceilings or for wainscoting. The product is either sold as packages of precut paneling, which can be used directly or cut into lengths for wainscoting, or packages of wainscoting (that is paneling cut to a standard shorter lengths).

- Structural paneling includes OSB, wafer board and plywood. Some years ago the enthusiasm for structural plywood paneling waned; however, according to a study⁷ since 1994, the market for paneling products has stabilized. The size of the lumber paneling market is estimated to 50 - 75 million bf⁸ per year.

Composite paneling typically consists of:

- Hard board, a compressed fibre product with cylinder impressed designs;
- Mende board, a particle board with paper overlay, or;
- Lauan, which is imported from the orient, and then is papered or wet printed.

Solid wood lumber paneling typically consist of:

- Cedar (80%), Western Red Cedar tight knot and clear grade;
- Lodgepole pine (approximately 20%), rustic and clear grade, or;
- Oak (occasionally).

The panels are beveled and tongue and grooved on the ends and sides. Paneling varies in thicknesses and come in a number of patterns. The traditional pieces of paneling are nominally 1" to 5/16" thick. Pieces can also be 3 1/2", 4", 5" 6" 8" wide by 1/2", 11/16" thick. Lengths can be 4', 6' 8'. An example of a panel product is pine 5/16" x 3 1/2" by 8' lengths packaged in bundles of six. Packages of paneling are shrunk wrapped and labeled with instructions for glue nailing. Patterns include straight V groove, beaded, Pickwick and channel pattern.

In Canada, solid wood paneling is simply called paneling whereas in the States it is called plank paneling. Paneling is a niche market item and, according to two US brokers, the entire US market is supplied by Canadian plank paneling producers. According to one British Columbian manufacturer, 5% is shipped to the BC market, 50% to the rest of Canada and 45% to the US. Another BC manufacturer said 2% is shipped to the BC market, 5% to the rest of Canada, 50 to 55% to the Eastern US and California, and the rest to the Pacific Rim (Japan, Taiwan and Korea).

Paneling is distributed through lumber yards, Do It Yourself (DYI) outlets, Home Centers and directly to contractors. Most British Columbian paneling is distributed by Macmillan Bloedel, Canwall, Chesapeake Hardwoods and Georgia Pacific through DYI centers such as Revelstoke or Irlly Bird.

Promotion of paneling occurs at the distribution retail level. The Canadian manufacturing company extends promotional monies which are used as the distributors and retailers see fit. Usually the funds are used for retail in-store displays, pamphlets or flyer distribution.

Some of the comments we received from British Columbian Panel Producers included:

⁷Value-added in the Kootneys, Status and Opportunities, 1994.

⁸ Value-Added Opportunities in the US for Solid Wood Products from Alberta.

"We started 18 years ago buying the wood needed to make cedar and pine paneling. Then, after a couple of years, we started our own sawmill because we were having trouble getting wood and having it dried properly by the dimensional companies."

"Paneling is not a lumber product ... it is a decorative product that competes with paint, wallpaper, cork board, and mirrors ... at the retail level the buyer does not take into account the fluctuations in wood prices he believes the paneling prices should be consistent ... not like the prices of dimensional lumber."

"Distributors from the Southern States will say there is no demand for lodgepole pine because they are marketing their own yellower plantation pine ... they have marketed their plantation pine very well."

"A couple of week ago (the beginning of July) we started making thin paneling out of lodgepole pine, we have two shifts and can't keep up with demand ... we have orders for the next 2 months ... it is going to the Eastern US ... if we couldn't get it distributed through Chesapeake it would be no problem ... it would go through either MacBlo or somebody else."

Some of the research findings with respect to the use of aspen for paneling are as follows:

- A small concentration yard in Wisconsin said, "the #1 product that our customers make from aspen is rustic grade paneling."
- In an Alberta government report, it was indicated that "there has been an attempt by solid wood paneling industry to introduce aspen as a white show wood."
- One company currently makes two grades of aspen paneling: a rustic grade and a clear grade. The rustic grade retails for about \$1,400/1,000 bft and the clear grade for \$1,800/bft. The aspen utilization yield for this supplier is 40%.
- Another company had tried to make paneling out of aspen. The owner said that the aspen looked nice for paneling especially with the knots and the red streaks. However the product was not viable due to the price issues. When asked to elaborate, he said even though the cost of the aspen logs is less than the pine, by the time the aspen is processed the price is much higher than the pine.
- The red stain, which is common in large mature aspen, is considered a defect by some major purchasers and conversely regarded as desirable by others for use as wall paneling.

Examples of some manufacturers which have produced paneling include:

Company: Bill Smith Forest Products
Location: Chemainus
Products: 5% of custom orders are for paneling out of alder, maple, hemlock and fir

Company: Francois Lake Woodworking Ltd
Location: Francois Lake, British Columbia
Products: Paneling out of aspen and lodgepole pine and flooring out of lodgepole pine and birch.

Company: Vernon Kiln Drying and Millwork
Location: Vernon
Products: Paneling using cedar, lodgepole pine and aspen

Company: C & C Wood Products
Location: Quesnel
Products: Paneling and Wainscoting using cedar and lodgepole pine

Company: Greenwood
Location: Penticton
Products: Paneling, distributed through Macmillan Bloedel

Company: Moberly Wood Products Ltd.
Location: Golden, BC

Company: Harvey Berg, Mystic Wood Products
The company ceased operations. They had resawn aspen into 1' or 3/8" wall paneling, flooring and pallet stock.

12. Pallets and Wooden Boxes

According to Statistics Canada, there were 5 firms in BC producing wooden boxes and pallets in 1994. These 5 firms generated about \$18 million in revenues from goods of their own manufacture and employed 121 people. The value of BC production represents only about 7% of the \$273 million in value produced in Canada in 1994. As was noted in Table 2.17 in Chapter II, the value of wood boxes and pallets exported through British Columbia increased from \$2.7 million in 1992 (of which all was destined to the US) to \$7.8 million in 1996 (of which 95% was destined to the US).

In the United States, there are about 3,000 firms active producing pallets and wooden boxes; these companies generated revenues of about \$2.6 billion from all sources.

There are three kinds of pallet companies, those which manufacture and repair/recycle pallets, those that just repair/recycle or those which produce pallet parts. Pallets can be made from green or dried wood. Most pallet companies purchase lumber and cants directly from a sawmill or, secondarily, from brokers. Some pallet companies even have their own supply of lumber. The average amount of lumber used for a pallet is 16.8 board feet, with a range of 7 to 40 board feet per pallet. Most of the boards used in pallets are 1" thick; however, some are also between 2" and 3" thick.

The major issues faced by pallet producers are the wood availability and cost. The demand for pallets in the US and Canada has increased rapidly from about 25 million units in 1950 to 350 million in 1990. The pattern of demand roughly follows the shape of an exponential curve.

In the American market, both hardwoods and softwood are used in pallet production.

- In Texas, there is an even split between the use of hardwoods and softwoods for pallets. In Texas, in 1995, there were 32 million new and recycled pallets produced, valued at \$158 million US and using 589 Mmbf of wood and employing 1,700 people;
- In Pennsylvania, 94 % of pallet construction uses hardwoods;
- In Washington, 89% of the pallet construction uses softwoods.

In BC, most pallets are manufactured from low grades of softwood with minor volumes of alder. Aspen is used extensively in pallets in the United States. The advantages of aspen for pallets and boxes are its light weight, its light color, the fact that it inks well, wears smooth, has little tendency to split under stress, nails without splitting even at the ends, is sliverless and splinterless and is lower in cost than most other hardwoods.

Examples of some pallet producers that have used hardwoods include:

Company: Sunchild Forest Products
Location: Edmonton
Products: Pallets made out of green poplar (aspen), and spruce . Sunchild Forest Products' marketing radius is approximately 300 miles. They have distribution outlets in Edmonton and Joffer Alberta and Bellpin Saskatchewan. They have been operating for 20 years.

Company: Pacific Pallet Ltd.
Location: Aldergrove
Products: Pallets, bins and containers made out of alder, birch, maple, and lodgepole pine. The company has been operating since 1957.

Company: P.G. Pallets
Location: Prince George
Products: 4 way pallets and doors out of spruce, lodgepole pine and a little aspen.

Additional information on pallets can be obtained from the Canadian Pallet Council in Toronto. A new aspen mill has recently started operations in Northern Ontario and ships lumber to the Midwest.

13. Contract/Custom Products

Contract/custom products are defined as products that are made to order from a predetermined range of options. With the contract market, is it necessary to look at the economic drivers of a particular region. As in the Peace, area one of the drivers of the economy in northern Wisconsin has traditionally been agriculture. Therefore, in Wisconsin, a strong segment of the custom orders come from agricultural foodstuffs. For example, there are a number of companies that make cheese boxes with branded logos. According to a company that supplies aspen branded cheese boxes, branding a companies logo into a box is a simple task that adds significantly to the chargeable price and profit margins. The company representative stated "we have many customers for cheese boxes - one customer alone buys 300,000 boxes a year."

Customer processing companies convert lumber for a fee rather than sell their own remanufactured products. There customers are primary producers and occasionally wholesalers. These companies can provide several functions or a single function, such as kiln drying. Custom processing can be used as a form of outsourcing by primary producers to meet customer demands. In other words, large dimensional sawmills develop relationships with independent manufacturers to custom process wood into more specialized value-added products.

Some examples of custom processors include:

Company: Goose Creek Lumber Ltd
Location: Crescent Valley
This company ceased operations.

Company: Paulcan Enterprises Ltd.
Location: Chemainus
Makes dimensional products out of fir and hemlock and a little alder and maple. They cut 1" and 2" lengths and random widths.

Company: Primex Forest Products Ltd.
Location: Delta

Company: Uneeda Wood Products Ltd.
Location: Sardis
Custom remanufacturer that dries and resaws lodgepole pine, alder, hemlock, fir and spruce. They also make moldings.

Company: Vernon Kiln and Millwork Ltd
Location: Vernon
Manufactures panels, decor boards and lumber out of lodgepole pine, and poplar (aspen). They

Company: Wynndell Box & Lumber Company
Location: Wynndell, BC
Over the past 5 years they have produced an average of 550 Mbft per year of aspen and birch in 1" x 4" or even wider pieces. The owner sells all clear grade lumber to an Alberta furniture manufacturer.

14. Opportunities and Constraints

This section summarizes the major findings of our research regarding the opportunities and constraints associated with developing a value-added sector in the Peace.

15. The value-added wood industry in the Peace Region is in an early stage of development.

Eight of the Peace Value-added Wood Association members are currently producing value-added products in the region. Most of these companies have been established in the past five or six years. Based upon the results of our interviews, we estimate that these companies are generating about \$500,000 in revenues annually from the sale of the value-added products they produce (excluding sawmilling services).

16. Fibre is available to support a much larger value-added industry in the Peace.

There is an opportunity to direct a greater proportion of the softwood resource, currently used for dimension lumber, towards higher value applications. More importantly, the region has a major hardwood resource that is currently underutilized. For example, the 1996 deciduous harvest only represented 21% of the 1997 AAC in the Fort St. John Forest District and 36% of the AAC in the Dawson Creek Forest District. Most of the hardwood resource currently utilized is used for low value applications.

17. The Peace has the opportunity to follow the pattern of development established in other jurisdictions.

Our research indicates that value-added industries based upon aspen tend to follow a fairly predictable pattern of development: aspen is first thought of as a weed, then a useable resource, then a desirable fibre, and then a staple of the wood fibre supply. US states such as Wisconsin, Michigan and Minnesota have been successful developing strong value-added sectors based on aspen.

18. There is strong interest in further developing the value-added industry in the Peace.

This is perhaps best evidenced by the strong attendance at the FRBC meeting and the level of participation in the Peace Value-added Wood Association.

19. Opportunities exist with respect to a wide variety of products.

Aspen can be used in a wide variety of primary, intermediate, and final product applications. As in any product, the characteristics of aspen can affect its usefulness or desirability for certain applications. While almost any product that can be made out of wood can be made out of aspen, experience in other jurisdictions indicates that certain types of value-added products are more likely than others to utilize aspen. Some of the more common applications for aspen include:

- Value-added product components;
- Furniture products;
- Cabinets;
- Pallets and wooden boxes; and
- Other products including paneling.

20. The demand for wood products is strong.

Markets such as furniture, cabinets and flooring have seen strong increases in demand in recent years because of increased interest in wood, strong housing start figures, and a rapid expansion of the remodeling market.

21. The barriers to entry in the value-added sector are relatively low.

Unlike many manufacturing industries, the value-added wood products industry is characterized by relatively small operations with comparatively low capital requirements. On average, value-added firms in BC generated about \$6 million in sales in 1994; three-quarters of the value-added operations had annual revenues of \$3 million or less. On average, value-added firms employ 35 people with most of the operations employing 15 or fewer employees.

22. The lack of a custom dry kiln is a major constraint to the development of a local value-added industry.

There are no true custom kiln operations in the Peace, although Canadian Forest Products in Taylor and West Fraser have occasionally dried woods for local companies. As these operations are set up to dry large volumes of softwoods, the local companies have generally not been satisfied with the results. The lack of a drying facility:

- Can force manufacturers to use wood that has a higher moisture content than desired. High moisture content can significantly detract from the quality of the finished product;
- Causes manufacturers to rely primarily on air drying, which can significantly increase their inventory requirements;
- Extends the lead time needed to fulfill orders and, therefore, serves as a major competitive disadvantage vis-a-vis other suppliers; and
- Makes the manufacturers less responsive to customer needs and market opportunities.

The value-added industry in the Peace faces a chicken and egg situation.

It can be argued that the region does not have a significant value-added industry because it does not have a custom drying facility. On the other hand, industry has not been willing to develop a custom drying facility in the Peace because the existing value-added industry is not currently large enough to support it.

23. Based on the experience of existing value-added manufacturers in the Peace as well as similar operations in other jurisdictions, the primary market for value-added manufacturers in the Peace will be the domestic market.

Most value-added operators distribute their products within a 200 mile to 500 mile radius of their facility. A 500 mile radius from Dawson Creek or Fort St. John would include Vancouver, Edmonton, Calgary, and smaller centers such as Lethbridge, Prince George, and Victoria.

24. In terms of export markets, the primary market will likely be the United States rather than longer-distance markets such as Japan.

The results of our research indicate that most of the value-added production in BC is distributed in Canada. A study by Forintek indicated that only about one-third of value-added firms generated 25% or more of their revenues from exports. The reliance on the domestic markets tends to be highest for products such as millwork and cabinets.

Statistics Canada indicates that the vast majority of value-added wood products exported from Canada are destined to the United States. Although the value of exports to Japan has been increasing, it is still a small market for BC exports in comparison to the United States. Our interviews indicated some Japanese interest in aspen products because of the white colour of the wood. However, the only significant exports of aspen value-added products that we heard of was by a Japanese owned and operated plant in Wisconsin. Other representatives noted that it is a difficult market to penetrate, which has been made more difficult by increased competition from other countries and changes in foreign exchange rates.

25. Current and potential operators will have to undertake further research in order to better define their products and markets.

Our study has provided a brief overview of selected markets for value-added products. Operators who are interested in establishing or expanding operations will have to undertake further research in order to define the specific products they would produce and the markets they will be targeting.

26. While there are significant opportunities for development, there are also factors that will constrain the speed at which the value-added industry, based on local hardwoods, will develop.

Some of these factors include:

- There is limited familiarity with aspen and some industry players have a negative perception of the wood, which resulted from the product being processed incorrectly.

- Access to distribution channels, such as retail outlets, may be a constraining factor. For example, in the States, value-added producers list distribution to the retail marketplace as a major concern.
- Value-added producers tend to:

- Have a technical background rather than a marketing or business background;
 - Be product driven rather than market driven;
 - Have limited access to capital;
 - Have limited access to market information;
 - Be quite secretive and work independently.

Most value-added companies start as cottage industries run out of people's homes and serving local markets. These operations are often run by a "renaissance" type of individual who has experience in all aspects of operation from going out in the bush and cutting timber to drying, making and selling products.

- There tends to be a long learning curve associated with developing a value-added operation. It takes time to learn how to manage the fibre, make products, identify markets, and develop markets. This is especially true for products like aspen. Most people currently making value-added products have learnt through trial and error and hard work.
- There is concern about the quality of some of the aspen stands. Natural stands of aspen have many trees that in excess of 40 years old and prone to rot. This rot reduces the quality of the wood and incurs higher percentages of wastage when processed.

Transportation costs, including the costs of transporting in supplies and raw materials and transporting out finished products, can also be a constraint.

27. Potential Economic Impact of the Proposed Kiln Facility

28. Impact on Revenues and Employment

The kiln facility itself will generate an economic impact in that it will make expenditures in the region and will employ staff members. For example, we estimate that the kiln would pay about \$70,000 annually in wage (representing about 2 person years of employment) and would make other expenditures totaling about \$150,000. In addition, the development itself would involve capital costs of about \$750,000 of which about two-thirds would be made locally.

However, the potential economic impact of the kiln goes well beyond its own direct expenditures and employment. The primary economic impact of the kiln will result from the impetus that it provides to the local value-added industry. The kiln will provide local value-added manufacturers with access to over 4 million board feet of kiln dried lumber annually. In the first year, most of this lumber would be utilized by Abeda Wood Products which is considering establishing a value-added operation in the Fort St. John. As the local value-added industry develops, the kiln facility could be increased in size to meet local demand.

The question then becomes one of determining the economic impact of making over 4 million board feet of kiln dried lumber available to value-added manufacturers. In assessing the impact, we have assumed that:

- The kiln dried lumber would be used by the value-added manufacturers to produce products that would sell for an average of \$1,000 per thousand board feet of lumber used in its production (or \$1 per board foot). The actual return would vary depending upon the mix of products that were made. For example, paneling, which would likely constitute the majority of production in the first year, typically sells for \$1,000 or more per thousand board feet according to our interviews. Depending upon the product, furniture components may also sell for \$1,000 or more per thousand board feet while moldings may sell for \$1,500 or more per thousand board feet. The wholesale price of furniture can vary dramatically depending upon the product, with most products falling within a range of \$1,500 per thousand board feet to over \$4,000 per thousand board feet. An average price of \$1 per board foot would generate revenues of \$4 million annually, based on value-added production of four million board feet.
- Approximately 1 job would be created for every 140,000 board feet of lumber used. This is lower than the average of 110,000 board feet per job often quoted for the value-added wood sector. This 110,000 figure is based on a study of the value-added sector undertaken by Price Waterhouse in 1991. It would be expected that the ratio for the Peace would move towards the 110,000 average as more intensive operations such as furniture production develop in the region. Based on the ratio of 140,000 board feet per job, approximately 28.6 jobs would be created in the value-added sector.
- Wages and benefits would be equal to about 25% of revenues. As indicated in Table 4.13, this ratio is relatively consistent with the wage ratios for value-added wood manufacturers in British Columbia. Based on revenues of \$4 million, wages and salaries would therefore total \$1 million annually. Given 28.6 jobs, the average wage would be about \$35,000 which, after an adjustment for inflation, is consistent with 1994 wages shown in Table 4.13*.

Based upon these assumptions, the kiln would be expected to generate about \$4,000,000 in revenues for value-added operations and create about 31 jobs including the two full-time equivalent jobs at the kiln. Based upon the projected capital costs, the cost per job would be less than \$25,000.

29. Indirect and Induced Impacts

These job figures include only direct impacts. The kiln would also generate indirect and induced employment:

- Indirect impacts are generated when the kiln or a value-company purchases goods and services from other sectors. For example, a value-added company could purchase lumber, materials, supplies, utility services, and equipment.
- Induced impacts occur when the value-added companies pay employees to produce their products. The employees then spend their wages and salaries, which stimulates further economic activity and rounds of spending through the economy.

Price Waterhouse, in their study *The Forest Industry in British Columbia 1996*, used an employment multiplier of 3.0 in determining the total impact of the industry on employment in BC. By applying this multiplier, the number of jobs that would be created is estimated to be 93 and the

* Please see Appendices

cost per job would be about \$8,000 based upon the projected capital costs.

Price Waterhouse indicated that this multiplier, which is generally accepted in BC, is conservative in relation to other multipliers commonly quoted. For example, an article by a Forest Economist from Statistics Canada estimated that the direct, indirect and induced multiplier for Canada was 4.293. If we adopted this multiplier, number of jobs that would be created would be estimated as 133 and the cost per job would be under \$6,000.

30. Payments to Government

The combined revenues of the kiln operation and the value-added operations is estimated to be about \$4.4 million annually. According to the Price Waterhouse annual studies of the forest industry in BC, the industry has paid about 6% of its revenues to government in recent years as income tax, sales tax, property taxes, and taxes included in electricity rates. If we adopt this 6%, the value-added companies and the kiln operation will pay about \$260,000 annually to government.

In addition, the workers employed by the kiln and the value-added operations will pay income taxes, Canadian Pension Plan (CPP) contributions and Unemployment Insurance (UI) premiums. Based upon the Price Waterhouse study, these payments represent about 30% of the wages and benefits paid (including the premiums paid by employers). Based upon this percentage, payments to government related to direct employees is projected to be about \$320,000 annually (30% of about \$1,070,000).

Therefore, the total payments to government are projected to be \$580,000. As such, if government were to provide funding for the entire capital cost, it would recoup its investment in the form of increased government revenues in less than a year and a half.

TABLE 4.13

**EMPLOYMENT STATISTICS RELATED TO THE VALUE ADDED SECTOR
IN BRITISH COLUMBIA IN 1994**

Product	Wages Paid (\$ millions)	Revenues (\$ millions)	% of Revenues	Number of Employees	Average Wage
Wooden Kitchen Cabinet and Bathroom Vanity	\$49.7	\$168.4	29.5%	1,759	\$28,255
Wooden Door and Window Industry	48.0	209.5	22.9%	1,479	\$32,454
Other Millwork Industries	55.8	224.5	24.9%	1,631	\$34,212
Wooden Box and Pallet Industry	4.0	17.7	22.6%	121	\$33,058
Wooden Household Furniture	28.0	103.7	27.0%	1,179	\$23,756

Appendix

TABLE 2.3

APPORTIONMENT OF CONIFEROUS AAC BY TSA

Coniferous Category			Mackenzie		Dawson Creek		Fort St. John		Fort Nelson		Total	
			m3	% AAC	m3	% AAC	m3	% AAC	m3	% AAC	m3	% AAC
Forest Licences			2,661,205	90.2%	496,613	57.7%	704,793	64.1%	538,973	89.8%	4,401,584	79.9%
Timber Sales	Small Business Enterprise Program	Any Category (Section 16)	–	0.0%	–	0.0%	21,795	2.0%	28,366	4.7%	50,161	0.9%
		Category 1 (Section 16)	–	0.0%	124,650	14.5%	70,000	6.4%	–	0.0%	194,650	3.5%
		Category 2 (Section 16)	–	0.0%	10,000	1.2%	10,000	0.9%	1,200	0.2%	21,200	0.4%
		Bid Proposal (Section 16.1)	183,597	6.2%	44,490	5.2%	45,423	4.1%	29,861	5.0%	303,371	5.5%
	Designated Applicant less than 10,000 m3	–	0.0%	72	0.0%	–	0.0%	–	0.0%	72	0.0%	
Woodlot Licences			20,000	0.7%	18,850	2.2%	17,904	1.6%	1,600	0.3%	58,354	1.1%
Forest Service Reserve			29,511	1.0%	15,498	1.8%	11,000	1.0%	–	0.0%	56,009	1.0%
Non-Replaceable Licences			56,808	1.9%	150,000	17.4%	219,085	19.9%	–	0.0%	425,893	7.7%
TSL> 10000 m3			–	0.0%	–	0.0%	–	0.0%	–	0.0%	–	0.0%
Pulpwood Agreements			–	0.0%	–	0.0%	–	0.0%	–	0.0%	–	0.0%
Total Coniferous			2,951,121	100.0%	860,173	100.0%	1,100,000	100.0%	600,000	100.0%	5,511,294	100.0%

TABLE 2.4

APPORTIONMENT OF DECIDUOUS AAC BY TSA

Deciduous Category			Mackenzie		Dawson Creek		Fort St. John		Fort Nelson		Total	
			m3	% AAC	m3	% AAC	m3	% AAC	m3	% AAC	m3	% AAC
Forest Licences			—	n/a	—	0.0%	—	0.0%	134,743	15.0%	134,743	4.8%
Timber Sales	Small Business Enterprise Program	Any Category (Section 16)	—	n/a	81,000	8.1%	180,000	19.7%	7,092	0.8%	268,092	9.5%
		Category 1 (Section 16)	—	n/a	—	0.0%	—	0.0%	—	0.0%	—	0.0%
		Category 2 (Section 16)	—	n/a	—	0.0%	—	0.0%	300	0.0%	300	0.0%
		Bid Proposal (Section 16.1)	—	n/a	—	0.0%	—	0.0%	7,465	0.8%	7,465	0.3%
Woodlot Licences			—	n/a	15,000	1.5%	15,000	1.6%	400	0.0%	30,400	1.1%
Forest Service Reserve			—	n/a	—	0.0%	9,000	1.0%	9,616	1.1%	18,616	0.7%
Non-Replaceable Licences			—	n/a	—	0.0%	193,000	21.1%	129,384	14.4%	322,384	11.5%
Pulpwood Agreements			—	n/a	904,000	90.4%	518,000	56.6%	611,000	67.9%	2,033,000	72.2%
Total Deciduous			—	n/a	1,000,000	100.0%	915,000	100.0%	900,000	100.0%	2,815,000	100.0%

TABLE 2.5

VOLUME OF TIMBER HARVESTED BY FOREST DISTRICT, 1995 AND 1996

Species	Mackenzie				Dawson Creek				Fort St. John				Fort Nelson				Total			
	1995		1996		1995		1996		1995		1996		1995		1996		1995		1996	
Forest District	m3	%	m3	%	m3	%	m3	%	m3	%	m3	%	m3	%	m3	%	m3	%	m3	%
Coniferous																				
Pine	1,044,005	32.1%	985,378	38.7%	522,769	29.6%	558,546	33.2%	249,179	23.5%	397,117	32.3%	88,845	9.6%	60,646	4.3%	1,904,798	27.2%	2,001,687	29.1%
Spruce	1,417,103	43.6%	992,812	39.0%	549,312	31.1%	664,862	39.5%	512,164	48.3%	624,083	50.8%	592,722	64.0%	746,349	53.0%	3,071,301	43.8%	3,028,106	44.1%
Balsam	791,986	24.3%	567,375	22.3%	93,490	5.3%	99,930	5.9%	18,177	1.7%	17,735	1.4%	14,894	1.6%	19,228	1.4%	918,547	13.1%	704,268	10.3%
Sub-total																				
Coniferous	3,253,094	100.0%	2,545,565	100.0%	1,165,571	66.0%	1,323,338	78.6%	779,520	73.5%	1,038,935	84.5%	696,461	75.2%	826,223	58.7%	5,894,646	84.1%	5,734,061	83.5%
Deciduous																				
Aspen	-	-	-	-	538,805	30.5%	328,259	19.5%	244,524	23.1%	157,476	12.8%	188,801	20.4%	448,642	31.8%	972,130	13.9%	934,377	13.6%
Cottonwood	-	-	-	-	62,618	3.5%	32,475	1.9%	36,177	3.4%	32,242	2.6%	41,246	4.5%	134,664	9.6%	140,041	2.0%	199,381	2.9%
Sub-total	0	0.0%	0	0.0%	601,423	34.0%	360,734	21.4%	280,701	26.5%	189,718	15.4%	230,047	24.9%	583,306	41.4%	1,112,171	15.9%	1,133,758	16.5%
Deciduous																				
Total																				
Coniferous & Deciduous	3,253,094	100.0%	2,545,565	100.0%	1,766,994	100.0%	1,684,072	100.0%	1,060,221	100.0%	1,228,653	100.0%	926,508	100.0%	1,409,529	100.0%	7,006,817	100.0%	6,867,819	100.0%

Note: Only species having significant volumes are included

TABLE 4.6

**LISTING OF PRODUCTS THAT CURRENTLY ARE OR
POTENTIALLY COULD BE MADE FROM ASPEN**

Primary Products	Intermediate Products	Final Products
remanufactured products - lumber specialities - custom processing - sawmill speciality products - fencing / fencing panels - panelboard - veneer - decorative slice	engineered products/industrial components prefab building/housing components - edge glued components - furniture components - laminated components - staircase components l beams, glued and laminated beams	wood novelties - toys - wooden shoes - picture frames - carvings and artwork - trophies
structural - mine timbers - cants - studs	millwork - architectural - interior trim moulding - custom - doors - shutters and windows - turned wood products (spindles) - paneling - fascia	furniture/commercial/office/ hotel/ restaurant/institutional/household shelving - utility - systems furniture - modular furniture - ready to assemble (rta) - head and foot boards - wardrobes - chests - bookcases - chairs - patio furniture
flitches	finger joint blocks	boats
plywood	cabinets - kitchen and vanity cabinets - countertops - case goods	stamped products - chopsticks - tongue depressors - matches
OSB wafer board	side rail and slats	garden products
	door /garage door - blank stock - door stiles	playground equipment
	posts, poles and pilings	ladders
	lathes, stakes, strips and batten	shakes and shingles
	turning squares, laminated window squares	conservatories and gazebos
	parallum	wooden tubs, casket, coffin
	floor products - decking - stair treads	pallet, coral rails ,box, bins, crating

TABLE 2.8

LISTING OF PRIMARY PROCESSING FACILITIES BY FOREST DISTRICT

Mill Type	Mackenzie		Dawson Creek		Fort St. John		Fort Nelson	
	Company/Location	Volume	Company/Location	Volume	Company/Location	Volume	Company/Location	Volume
Lumber Mills (Million Board Ft.)	Finlay Forest Industries, MacKenzie	134.4	Canadian Forest, Products, Chetwynd	153.6	Canada Forest Products, Taylor	67.2	Tackama Forest Products Ltd., Fort Nelson	76.8
	Finlay Forest Industries, Mackenzie	120.0	Chetwynd Forest Industries, Chetwynd	180	Canada Forest Products, Fort St. John	158.4		
	Timber West Forest Ltd., Mackenzie	151.2	Four Can Ventures Chetwynd	4.8				
	Timber Forest West Ltd. Mackenzie	184.8	Redekopp Custom Sawmilling, Chetwynd	2.4				
Chip Mills (’000 of BDUs)	Sonic Booming Ltd., MacKenzie	57.6			North Peace Timber	55.2		
	East Fraser Fibre Co Ltd, MacKenzie	96.0						
Log Homes (no volumes available)			Hudson Hope Log Homes, Hudson Hope					
			Trunor Log Industries, Farmington					
Pulp and Paper Mills (000s of Metric Tonnes)	Finlay Forest Industries, MacKenzie	362.3	Louisiana Pacific, Chetwynd	155.3	Fibreco Pulp Inc., Taylor	213.9		
	Fletcher Challenge, Mackenzie	207.0						
Veneer, Plywood & Other Panel Mills (million s/q. ft on 3/8" basis)			Louisiana Pacific, Dawson Creek	252.0			Tackama Forest Products, Fort Nelson	333.6
							Slocan Forest Products, Fort Nelson	160.8

TABLE 2.11

**MANUFACTURING STATISTICS FOR THE
BC WOOD PRODUCTS INDUSTRIES, 1994**

Sector	Number of Establishments	Value of Goods Manufactured		Employment	
		Millions	%	Number	%
Sawmill and Planing Mill	253	\$8,906.5	79.5%	30,432	69.5%
Shingle and Shake	46	227.0	2.0%	1,392	3.2%
Hardwood Veneer and Plywood	2	n/a	n/a	n/a	n/a
Softwood Veneer and Plywood	19	n/a	n/a	n/a	n/a
Prefabricated Wooden Buildings	18	77.3	0.7%	546	1.2%
Wooden Kitchen Cabinet and Bathroom Vanity	83	168.4	1.5%	1,759	4.0%
Wooden Door and Window Industry	47	209.5	1.9%	1,479	3.4%
Other Millwork Industries	54	224.5	2.0%	1,631	3.7%
Wooden Box and Pallet Industry	5	17.7	0.2%	121	0.3%
Coffin and Casket	1	n/a	n/a	n/a	n/a
Wood Preservation	18	114.1	1.0%	332	0.8%
Particle Board	7	n/a	n/a	n/a	n/a
Wafer Board	1	n/a	n/a	n/a	n/a
Other Wood Industries	39	80.7	0.7%	735	1.7%
Wooden Household Furniture	40	103.7	0.9%	985	
Total	633	\$11,207.4	100.0%	43,780	100.0%

Source: Statistics Canada

Note: n/a indicates that Statistics Canada has not released the data because of confidentiality issues caused by the small number of establishments included in that category.