IMPACT OF THE BRITISH COLUMBIA FOREST
RESOURCES COMMISSION'S RECOMMENDATIONS ON
THE STRUCTURE AND PRODUCT MIX OF THE SOLID
WOOD PRODUCTS SECTOR

Prepared for the British Columbia Forest Resources Commission

by

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TABLE OF CONTENTS

TABLE OF CONTENTS
LIST OF FIGURES
LIST OF TABLES
ACKNOWLEDGEMENTS
EXECUTIVE SUMMARY
OBJECTIVES
METODOLOGY AND DATA SOURCES
DEFINITION OF FURTHER MANUFACTURED WOOD PRODUCTS
POLICY OBJECTIVES AND IMPLEMENTATION
INDUSTRY PROFILE AND HISTORICAL PERSPECTIVE
THE COAST INDUSTRY
THE INTERIOR INDUSTRY
DEVELOPMENT OF THE FURTHER MANUFACTURING INDUSTRY
ANALYTICAL FRAMEWORK
DISTRIBUTION OF ECONOMIC OUTPUT
WHAT IS VALUE ADDED?
WHY DO FIRMS CHOOSE TO MANUFACTURE A CERTAIN MIX OF PRODUCTS?
PUBLIC OBJECTIVES
TIMBER ALLOCATION, INDUSTRY STRUCTURE AND PRODUCT MIX
DETERMINANTS OF THE PRODUCT MIX
HIGHER VALUED PRODUCTS AND MARKETS
INPUT COST AND AVAILABILITY
TECHNOLOGY TYPE AND AVAILABILITY

TIMBER ACCESS

56
57

THE INTERIOR

60

HIGHER VALUE PRODUCTS AND MARKETS

60

INPUT COST AND AVAILABILITY

63

TECHNOLOGY TYPE AND AVAILABILITY

66

TIMBER ACCESS

66

THE COAST

74

HIGHER VALUED PRODUCTS AND MARKETS

74

INPUT COST AND AVAILABILITY

77

TECHNOLOGY TYPE AND AVAILABILITY

78

TIMBER ACCESS

78

CONCLUSIONS

83

RECOMMENDATIONS

93

APPENDIX ONE

95

APPENDIX TWO

98

LIST OF FIGURES

Figure One

Coast Harvest Volume

34

Figure Two

Interior Harvest Volume

34

Figure Three

B.C. Lumber Shipment Volume 1951-1990

35

Figure Four

B.C. Lumber Shipment Value 1964-1988

35

Figure Five

Unit Values of Lumber Shipments 1964-1988

35

Figure Six

Number of Sawmills in B.C. 1951-1988

36

Figure Seven

Average Mill Size by Shipment Volume 1951-1988

36

Figure Eight

Average Labour Productivity 1951-1988

36

Figure Nine

Employees per Thousand Cubic Metres of Shipment

36

Figure Ten

Trends in Real Prices for Douglas-fir Lumber

37

Figure Eleven

Unit Values for B.C. Lumber Exports

37

Figure Twelve

Volume of B.C. Lumber Exports by Region

38

Figure Thirteen

Value of B.C. Lumber Exports by Region

38

Figure Fourteen

Distribution of Total Value of Wood Products

40
LIST OF TABLES

Table One: Allocation of Allowable Annual Cut
- British Columbia Coast  23

Table Two: Allocation of the Allowable Annual Cut
- British Columbia Interior  30

Table Three: Estimated Size of the Lumber Remanufacturing Industry 1982 - 1991  32

Table Four: Estimated Size of the Secondary Wood Processing Industry 1982 - 1991  33
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IMPACT OF THE BRITISH COLUMBIA FOREST RESOURCES COMMISSION'S RECOMMENDATIONS ON THE STRUCTURE AND PRODUCT MIX OF THE SOLID WOOD PRODUCTS SECTOR

EXECUTIVE SUMMARY

The objective of this study is to examine the implications of the British Columbia Forest Resources Commission's recommendations on timber resource allocation for the structure and product mix of the provincial solid wood products sector, with particular emphasis on further manufactured (commonly referred to as value added) wood products.

Sources of information upon which the analysis is based include published and unpublished documents and in depth interviews with a number of individuals and groups representing a broad spectrum of the wood products industry.

Further manufacturing is defined as "all ways in which the value of output of the wood products sector can be increased". This definition includes operations taking place in logging, primary processing, lumber remanufacturing and secondary processing.

The institutional environment in which the wood products industry operated between the late 1970s and the present is described with particular emphasis on public policies designed to allocate the timber resource between competing industrial uses. It is suggested that public objectives for British Columbia's
forest industries include: economic efficiency: higher value added; and increased employment opportunities.

The evolution of the British Columbia solid wood products sector is described for the Coast and Interior of the Province and historical trends in shipments, prices, number of mills, average mill size, employment, productivity and product mix are analyzed. The development of the further manufacturing sector during the 1980s is documented.

The present structure of the industry, with respect to the allocation of the AAC, is presented in tabular form and the impact on these allocations of the Forestry Resource Commission's recommendations are analyzed.

A simple analytical framework within which to examine public goals for the forest industries is developed. Value added, profit margin, and economic rent, or stumpage, are defined. It is pointed out that policies designed to maximize the value of the timber resource (maximum economic efficiency) do not necessarily maximize the value added in timber processing nor satisfy public employment objectives. Firms pursue maximum profits. They choose that combination of outputs (i.e., their product mix), inputs (raw materials, energy, labour and capital) and processing technology which, they believe, will maximize their profit margins. The highest profit margins do not necessarily equate with maximum product values or the highest value added.

Within the analytical framework developed, the relationships between timber allocation, industry structure and product mix are examined. This section of the study relies heavily on personal interviews conducted throughout the Province. The Interior and Coast are dealt with separately. The factors considered include: products and markets; the cost and availability of labour and capital; access to appropriate technology; and access to timber.

It is concluded that:

- the creation of competitive timber markets would reshape the structure of the forest industry. However, it is likely that these changes would be incompatible with public objectives for the industry. The net result would probably be a more concentrated primary processing sector in the Interior and relatively smaller independent sawmilling and further manufacturing sectors. The costs in terms of industrial dislocation, reduced employment opportunities and community stability could be major. In contrast, on the Coast, under certain conditions, concentration in control over primary breakdown capacity might be reduced and the proportion of small to medium sized sawmills increased. The changes would have little impact on the independent remanufacturing and secondary processing sectors.

Timber availability is an oversimplification of the many factors affecting the establishment and growth potential of smaller scale, regionally owned and operated manufacturing plants. More pressing problems are markets, labour costs and access to capital. With the possible exception of independent primary processors on the Coast, it is doubtful that more competitive timber markets would help this segment of the industry.
Relatively low, administratively determined stumpage prices "do not drive the solid wood industry towards the manufacture of lower value commodity products". The major force driving a firm towards a certain product mix is the desire to maximize profits. A firm's choice of outputs depends on product values and all the costs associated with manufacturing and delivering them to market. There is no reason to believe that competitive markets for timber will result in a higher percentage of further manufactured products in the product mix. Adding value also means adding cost and will only be pursued if such a strategy improves net returns and, thus, enhances a firm's ability to compete in the market place for timber and other inputs.

It is recommended that:

- Timber supply allocations to various industrial users and the structure of the forest industry should be dealt with in a coordinated manner in order to develop a comprehensive industrial strategy for the Province's forest products sector.

- It be explicitly recognized that public goals for the forest industry - economic efficiency, higher value added, and increased employment opportunities - are not complementary and that methods be developed for evaluating the trade-offs and achieving a balance between them.

- The timber supply and allocation requirements of a forest industrial strategy be coordinated with an overall land use strategy for the Province's forests.

OBJECTIVES

In 1976 the Pearse Royal Commission recognized the increasingly concentrated structure of the British Columbia forest industry, particularly with respect to timber harvesting rights, as detrimental to provincial interests. These interests include both the maximization of returns to the province from the utilization of the resource, in the form of stumpage payments, and maintaining the vitality of an export based industry operating in an increasingly competitive global economy.

The 1991 report of the British Columbia Forest Resources Commission echoes these concerns. The Commissioners see the creation of competitive timber markets as a key strategy in reshaping the structure of the forest industry. Such changes, they believe, would ensure that direct returns to the people of the province from resource use would be maximized. Furthermore, they suggest that competitive markets would favour a more diverse, less concentrated industrial structure by removing an important barrier to entry - access to wood supply. This barrier they were told "killed many innovative value added manufacturing proposals before they got off the ground". They believe that by creating a level playing field of equal conditions of access for all through markets for wood, there will be some assurance that wood will be put to its most efficient use and, further, that more raw material will be diverted into the manufacturing of higher value products. The Commissioners see these developments as contributing to their vision of a new, more diverse forest industry which would place added emphasis on local participation in both forest management and manufacturing, increase employment per unit volume of wood used and contribute to regional stability.

The general objective of this study is to examine the Forest Resources Commission's hypotheses in the context of recent changes in the structure and product
mix of the solid wood products sector in British Columbia and advise the Commissioners on whether, in the opinion of the contractors, their recommendations on the methods of timber resource allocation would realize the desired goals.

More specifically the study objectives are:

To examine recent changes in the structure of the forest (wood based) industry and the mix of products it produces to identify any evidence which will support the hypothesis that the creation of competitive timber markets is a key to reshaping the structure of the forest industry.

To determine whether an open log market would solve the problem of timber availability given the hypothesis that a major barrier to the establishment of smaller scale, regionally owned and operated manufacturing plants is timber availability.

Given the hypothesis that relatively low administratively determined stumpage prices have an impact on the industry's product mix, pushing it towards lower value commodity products, to determine whether a freely competitive timber market will result in a higher percentage of further manufactured forest products in the product mix and, moreover, that plants producing such products will be more labour intensive (i.e., more person hours used per unit of raw material) than at present.

To draw conclusions about the possible reasons for the changing product composition of British Columbia's wood industry (if indeed such changes can be demonstrated), paying particular attention to the impact of policy changes affecting raw material prices and access to raw material.

To discuss implications of the project's results on future policy directions.
METHODOLOGY and DATA SOURCES

This study is concerned with the reasons why manufacturers in the solid wood products sector choose to market their output at a certain stage in processing rather than continuing to add further value to their products before they finally enter the marketplace. Of interest also is the technology chosen for the conversion processes in terms of size of production unit and degree of labour intensity. The particular focus is the role of timber allocation policy in influencing the product mix and production technology.

Our methodology has focussed on gaining an understanding of the determinants of the value of the industry's product mix and the structure of the industry in terms of firm scale and amount of employment. This knowledge was used to analyze policy initiatives designed to modify the mix of products in ways which will augment their value and to increase the participation of smaller scale, more labour intensive manufacturers.

The remaining sections of the report follow this general approach. First, a definition of the further manufactured or value added wood sector is presented. This is followed by an examination of relevant public policies. Next, information has been gathered and synthesized in order to estimate the current size, value and product mix of the industry, and to provide comparative data from which historical trends can be discerned. The sources of data for these parts of the report are the published and unpublished sources listed in Appendix One. It should be noted that the most recent and most comprehensive directory of the B.C. wood products value added sector only became available in the final days of the study (McWilliams 1991).

Next, an analytical framework has been developed within which to analyze the factors affecting the structure and product mix of the solid wood processing sector. This is followed by an analysis of these questions based upon data collected directly from those involved in the industry. Given the time and resources allocated to this study, it was impossible to carry out a comprehensive statistical survey of the wood products industry. Instead, we conducted a limited number of in-depth interviews with groups and individuals directly concerned with the production of further manufactured wood products. Those interviewed reflect the broad spectrum of the industry, including primary sawmills, lumber remanufacturers and manufacturers of secondary wood products and ranged from individual owner/managers of small private firms to representatives of major integrated companies. In order to economize on our time and, also, to get more representative viewpoints, we met with groups representing various industry associations including the B.C. Wood Specialties Group (BCWSG), the Interior Lumber Manufacturers Association (ILMA), the Independent Lumber Remanufacturers Association (ILRA), the Interior Value Added Wood Association (IVAWA) and the Interior Category 2 Wood Processors Association. A complete list of interviewees, together with a brief description of the firms represented by the individuals interviewed, can be found in Appendix Two.

In the next section, conclusions are drawn concerning the impacts of the Forest Resources Commission's recommendations for changes in timber allocation procedures on the structure and product mix of the solid wood products sector. Finally, recommendations are offered on how suggested policy initiatives might be modified.
DEFINITION OF FURTHER MANUFACTURED WOOD PRODUCTS

By further manufactured wood products we mean all ways in which the value of the output of the wood products sector can be increased. Crafted musical instruments, quality furniture and fine manifestations of the wood carver's art come to mind as high value products, but these are at the highest end of a spectrum of further manufactured products. A useful definition of adding value as any "economic activity where the output value is higher than the input value" comes from McWilliams (1991).

It is important, therefore, to embrace all phases of the solid wood products industry. This approach is a departure from the definitions used in some studies which suggest that further manufacturing, or increasing value added, implies the production of processed lumber products beyond the primary stage using different types of manufacturing facilities and, generally, targeting a different set of customers. McWilliams (1991) limits his definition of the value added sector to secondary wood products manufacturers for the purpose of compiling a directory but notes: "In the wood products sector of the B.C. forest industry, primary producers as well as secondary producers add value to their raw material." We would expand McWilliams' definition further to suggest that the process of adding value starts in the woods.

While, for convenience, the process of adding value to wood is divided into individual stages, it is, in fact, a continuum which starts with standing trees and is open ended as far as the nature of the product sold to the final consumer is concerned. Here we identify four major stages in the solid wood processing sector, each one concerned with adding value to the raw material.

- **Logging:** in which standing trees are felled and converted into logs. The difference in value between the standing trees and the logs is the value added in logging, and this will depend in part on the skill and care with which the trees are felled and the logs made. The unit value of the logs produced depends upon the demand for logs. Further value can be added to the logs in the course of delivery to their user depending on how the logs are bucked, dressed and sorted. Adding maximum value at this stage involves knowledge of consumer preferences as expressed in willingness to pay.

- **Primary Processing:** in which logs are manufactured into lumber - or solid wood pieces of rectangular cross section. Lumber is not a homogeneous product and within this sector there are myriad opportunities for adding further value to the raw material including sorting by species; defect removal; trimming; cutting special sizes to meet customer's requirements; sorting for grade (clears, shop, dimension etc); mechanical stress grading; drying; and planing. Even generic commodity products can have value added to them by differentiating them into brand name products through packaging. Value can also be added through services which meet customer specific requirements.

While McWilliams (1991) notes that primary processors add value, he limits the definition of the value added sector to processing beyond primary breakdown and includes sawmill specialty products as a subgroup of remanufactured products. The report notes, however, that: "sawmill companies in B.C. probably have the greatest opportunity to
make more value-added products because of their control of log supply, access to market information and financial strength. The potential of primary processors to add value is discussed by Cohen (1992).

The division between primary processing and remanufacturing is frequently blurred, partly because some processes can be carried out either at the site of primary processing or in a different facility. Some examples would be kiln drying and planing which can be carried out by a primary processor or as a separate operation by a different firm, in which case, it would be considered remanufacturing. Other examples would be selection or further sawing to produce special select, shop and clear grades of lumber, or ripping to produce boards.

**Lumber Remanufacturing**: in which lumber as a raw material is converted into higher value products as a separate operation and, frequently, in a separate plant. This sector produces a broad range of merchandise including edge glued lumber; paneling; siding; flooring; patterned stock; moulding; shelving; furniture blanks; window blanks. We would also include finger joined lumber and machine stress rated lumber (MSR) though these are classified by McWilliams (1991) as commodity products. They do, however, involve additional costs in their production and command a premium in the market reflective of the added input costs. An important sub-sector of lumber remanufacturing in British Columbia is the cedar specialty industry which, as the name implies, produces a broad range of products exclusively from western red cedar.

**Secondary Processing**: in which lumber, or remanufactured lumber products, are used to produce finished, consumer products. In this section we include various product groups which are separately categorized in McWilliams's classification of the secondary industry in B.C. The justification for this is found in the summary matrix provided by McWilliams in which he indicates that the remanufactured products sector is the largest sector by all the measures used: employment, wood consumption, export sales and revenue generated. Thus we are defining the secondary processing sector to include all those products classified by McWilliams in the following groups: engineered building components: millwork; cabinets; furniture; pallets and containers; other wood products. These include such individual items as doors; windows; roof trusses; ready-to-assemble furniture or furniture components; cabinets; log homes; treated wood; custom joinery; turned wood products; chopsticks; ladders and boxes.
POLICY OBJECTIVES AND IMPLEMENTATION

Society receives a variety of important benefits from the processing of timber resources. Through ownership of the forest resource, the government of British Columbia has the opportunity to influence the benefits associated with the exploitation of its timber values. These benefits can be categorized under three main headings as:

- the wealth created in the form of the value added to timber in the course of processing activities;
- the revenue accruing to the government, on behalf of the public owners of the resource, as economic rent generated through the sale of public timber to processors;
- the jobs created in the timber processing sector, associated communities, and dependent industries.

The main instrument available to the Ministry of Forests to use in pursuit of these objectives is timber allocation policy. However, other branches of government at local, provincial and federal levels also have roles to play in that they have other means of influencing the development of the timber processing industry. This section describes the institutional environment in which the industry operated between the late 70s and the present with respect to the strategies implemented by the Ministry of Forests in pursuit of these objectives and their impact on the industry.

The 1976 Royal Commission on Timber Rights and Forest Policy in British Columbia (the Pearse Commission) stated that timber allocation policies appeared to have promoted large integrated firms at the expense of small independent operators. It was also suggested that efficiency in resource allocation, including maximum return to resource owners (highest stumpage price), which is associated with competitive markets had become secondary to other objectives.

These observations have been interpreted as implying that a different allocation policy would lead to a different processing industry: and, in particular, that a more competitive timber allocation policy would lead to a wood manufacturing sector which would provide, more effectively, the multi-faceted benefits society can receive from processing the resource. These ideas can be expressed as a hypothesis which involves the following chain of reasoning:

- Competition allocates timber to the highest bidder, which ensures that the province receives the highest benefit possible in the form of stumpage revenue.
- Economic theory tells us that this highest bidder is the one who will use the resource most efficiently, therefore, competition also ensures that the timber resource is allocated to its best use.
- Since large integrated firms exist under the present, biased, non-competitive allocation system, they exist because of that system and in an open market on a fair and level playing field would be outperformed to some extent by more efficient smaller firms.

The argument continues with an interpretation of most efficient use and best use. From the perspective of society, the best uses are those which best provide benefits in the form of stable and full employment and maximize the creation of wealth. Thus, the hypothesis proceeds with the following reasoning.
The more efficiently the resource is used, the more valuable the end product manufactured and, thus, the greater the wealth created. Thus greater efficiency in resource use results in the production of more highly valued goods.

Furthermore, since more valuable end products require a higher degree of processing, employment will also increase.

New policy was initiated following the Pearse Commission to specifically address the questions of industry structure and maximization of stumpage revenue. Special timber sales, which were designated for small businesses and were to be sold competitively, were introduced. Under this programme, which became effective in 1980, registrants in one of two categories - Category 1 (loggers who do not own or lease a timber processing facility) and Category 2 (timber processors who do not hold other rights to harvest Crown timber) - were given the right to bid on Crown timber specifically allocated to the programme.

The immediate goal was to make timber available specifically for small businesses to the exclusion of large integrated firms. Thus, the perceived bias of the existing allocation system towards large firms was offset by a programme biased toward smaller firms. These small, non-renewable sales were offered on a competitive basis to address the objectives of efficiency in resource use and maximization of stumpage revenue.

The programme was a success in terms of the interest it mustered among small firms and the additional stumpage revenues it generated for the Crown. It was considered less successful, however, as a means of promoting the entry to the industry of small firms manufacturing more highly manufactured products. To Category 1 bidders, the drive for greater efficiency consisted of either exporting logs or selling them to larger integrated firms. A link between successful Category 2 bidders, mainly located in the Interior, and the lumber remanufacturing and secondary processing industry was never firmly established.

The latter objective, however, was becoming increasingly important as the potential for increasing total value and total employment simply by increasing total volume was being sharply curtailed. The Ministry of Forests' Forest and Range Resource Analysis of 1980 set the provincial AAC at 75 million cubic metres and forecast future reductions in permissible harvesting levels. This brought home to the government the fact that the days in which expanding harvests could be relied upon to promote economic growth and increasing employment opportunities were over. With the provincial AAC almost totally committed to existing timber processing capacity, it was apparent that growth, or even maintenance, of the wealth generated by a fixed or declining timber base could only be achieved by increasing the value added in manufacturing through the production of products of higher market value.

A number of government sponsored inquiries were carried out during the 1980s to provide further information on the secondary wood products industry and to provide advice on strategies designed to restructure the solid wood products sector in ways which would encourage the production of a higher value mix of products. In 1984, such a study was carried out as part of the British Columbia Ministry of Forest's Resource Analysis, by Woodbridge, Reed and Associates. In 1986, Forintek Canada completed a study of Technological Needs in Lumber Remanufacturing. In 1988, a major investigation into A Value Strategy for B. C. Solid Wood Products was prepared by Deloitte Haskins and Sells with Carroll-Hatch Ltd for the Canadian Department of Regional Economic Expansion and the British Columbia Ministry of Regional
Development. The same year, Woodbridge, Reed and Associates produced another
study on The Status and Direction of the Lumber Remanufacturing Sector in British
Columbia for the Canadian Forestry Service under the Federal-Provincial Forest
Resource Development Agreement (FRDA). Under FRDA it a directory and report
entitled the Profile of the B.C. Wood Products Value Added Sector, referred to earlier as
McWilliams (1991), has just been completed.

In September 1987, the Minister of Forests and Lands announced a "new
direction for forest policy" in British Columbia. One of the initiatives proclaimed was
designed to:

"encourage a competitive and more diversified industry in British
Columbia. Programme modifications will stimulate additional
processing, developments in secondary and tertiary solid wood products
manufacturing and increased utilization of residual and specialty wood
resources."

Under the programme, given statutory force in July 1988, 5 per cent of the AAC
held under licence, mainly by the major companies, was diverted to the independent
remanufacturing and secondary processing industry. The notion that under true
competitive conditions such enterprises could flourish was not abandoned, but this
pro-active policy was perceived as a mechanism to ameliorate the impact of the existing
industry structure and allocation mechanisms on smaller, further manufacturing firms.
This new programme is variously referred to as "bid proposal sales" or 16.1 sales, after
the section of the Forest Act which provides its legislative authority. Under the
programme, sales are not necessarily awarded to the firm willing to pay the highest
price but, rather, to the firm which can most successfully meet a number of criteria
prescribed by the Ministry of Forests, the most important of which is the amount of
value which will be added as a result of the manufacturing process.

The bid proposal sales and the competitive small business sales, authorized
under the initial section 16 of the Forest Act, are collectively known as the Small
Business Forest Enterprise Program (SBFEP). According to the Ministry of Forests, the
objectives of this programme are threefold:

- to provide new opportunities for individuals and firms to enter the forest
  industry and establish businesses;
- to encourage diversification within the forest products industry and increase
  employment; and
- to ensure, through competition, that the most efficient firms are awarded timber
  sales and the province receives a fair rate of return for the forest resource.

The programme has been the subject of various reviews (for example Gillespie
(1991)) and there is currently a survey being conducted to determine the present status
of the projects of those who have received bid proposal sales.

The British Columbia Forest Resources Commission (FRC), which was
established to independently review and report to the Government on forestry issues,
made its first report public in April 1991. In this report it reiterated the observations
made by the Pearse Royal Commission of 1976 concerning concentration of control over
the forest resources of British Columbia. With respect to the timber processing
industry the FRC considered that:

"The degree of corporate concentration in tenure holdings raises greater
concern than the degree of corporate concentration in manufacturing
facilities." p. 36.

And, concerning objectives for the processing industry, it was concluded that:
"the wood processing industry must be allowed to evolve into whatever structure is needed to maintain its ability to compete in world markets." p. 59

This objective parallels the mandate of the British Columbia Forest Service as provided in the Ministry of Forests Act, that is:

"4(d) encourage a vigorous, efficient and world competitive timber processing industry in the Province."

The Commissioners recommended the establishment of a competitive market for wood to ensure the Province receives the highest value for timber. This was also seen as a means of promoting other provincial objectives for the timber processing industry. They suggested that a more competitive timber allocation system will result in higher stumpage revenue from more efficient use of the resource, and that some of these more efficient users will be small firms who produce higher value products and employ more people.

Specifically, under the Commission's proposals, current holders of long term harvesting rights will be allowed to retain, in part, their exclusive access to Crown timber. The general rule would be that no company with manufacturing facilities would be allowed to hold Crown tenures to harvesting rights in excess of 50 percent of the lesser of either their processing capacity or their present cut allocation (recommendations 57 and 58 of the Commission's report). However, existing Tree Farm Licencees would be "grandfathered" in that, as part of the conversion process to the proposed new tenure system, they would not be reduced in either area or volume, except when change of ownership occurs. The Commission also recommended that the Category 1 and 2 sales under the SBFEP be phased out (recommendation 68), but that Section 16.1 sales under the SBFEP be converted to area-based Resource Management Agreements where possible (recommendation 69).

These recommendations lead directly to the purpose of this study which is to examine the likely effects of the allocation policies recommended by the FRC with respect to society's objectives and expectations for the industry, with particular emphasis on the production of more highly manufactured wood products. In the following section, the history of British Columbia's solid wood products industry is described. An analytical framework is then developed within which this problem can be addressed.
INDUSTRY PROFILE and HISTORICAL PERSPECTIVE

In 1990, shipments of BC lumber totalled 14.0 billion fbm, with a value estimated to be $5 billion. The total sales revenue of the secondary wood processing sector in 1990 was estimated by McWilliams (1991) as $1.5 billion, of which the share from the remanufactured products group was $710 million. The lumber consumed in the generation of this revenue was estimated as 1.5 billion fbm for the sector as a whole, of which 1.2 billion fbm was used by lumber manufacturers. Thus, the unit revenue for remanufacturers was almost $600 per thousand fbm compared to $360 per thousand fbm for all lumber shipments, and $217 per thousand fbm for SPF dimension lumber.

The 1.5 billion fbm consumed by the secondary wood processing sector represented 60% of shipments of B.C. lumber within B.C., 40% of shipments to all Canada, and 11% of the total shipments of lumber. The output of this sector was produced in 565 establishments, of which 150 were remanufacturing plants, by approximately 12000 employees, of whom 3500 worked in remanufacturing. The numbers of establishments and employees in the sawmill sector are not available yet for 1990, but comparable figures for 1988 were 333 mills with 30696 employees.

The rest of this section describes the evolution of the British Columbia wood products sector and traces historical trends. This description differentiates between the industries of the Coast and the Interior of the Province. This is essential because the characteristics of the raw material base, the product mix, the markets served, the manufacturing technology used and the historical development of the industry differ significantly between these two regions. These regional histories concentrate on the primary processing sector. In a third part, the secondary wood products sector is discussed for the province as a whole because there is not sufficient historical data to discuss Coast and Interior separately.

THE COAST INDUSTRY

For a century, from its inception in the mid-nineteenth century until the 1950s, the lumber industry of the British Columbia Coast produced a wide spectrum of products ranging from select lumber grades of varying lengths and cross sectional dimensions to board products and more highly manufactured speciality items such as door and window stock, mouldings and clear Douglas-fir flooring. Through the growth of both domestic and export markets, the Coast industry soon became a mainstay of the provincial economy. The principal species used was Douglas-fir but some cedar products were produced and, latterly, hemlock-balsam. The huge size of the logs processed was reflected in mill outputs that were orders of magnitude greater than the Canadian average.

During the 1950s, however, things began to change. The rapid growth of the Coast Douglas-fir plywood industry in the years immediately following the second world war deprived the lumber industry of the highest quality clear logs. During this period, also, many of the remaining independent owner-managed sawmills disappeared and lumber capacity and control over timber rights became increasingly concentrated in the hands of a smaller number of fully integrated corporations.

During the 1960s, a number of factors came together simultaneously. The available harvest from the Coast, which had fluctuated about 15 million m$^3$ throughout the 1940s and 1950s, approximately doubled in the space of a single decade, to reach 30 million m$^3$, a level about which it has fluctuated, fairly wildly at times, in the 20 years since (Figure One) (Figures can be found at the end of this section pages 34 to
This was partly due to recalculation of available AAC and partly due to increased utilization standards. Concurrently, the import demand for construction grade dimension lumber in the United States market rapidly increased and the industry of the British Columbia Coast found that it could compete well with its green, random length, dimension lumber in the lucrative market of the eastern seaboard of the United States.

These demand and supply factors translated into an increase in lumber production from a level of about 2.5 billion fbm through the 1950s to 4.2 billion fbm in 1973 (Figure Three). In addition, average mill size, which had been slowly growing, increased sharply, as measured by annual shipments, from about 10 million fbm in the late 1950s to over 40 million fbm in the early 1970s (Figure Seven). The increase in total production did not compensate for the increased mill size and the number of sawmills continued a decline that had already started in 1950 (Figure Six).

The increased average size of plants was no longer associated simply with large logs, but reflected a switch in emphasis from quality, or value of output, to volume. Gangsaws, which are designed to produce standard dimensions, made their appearance in Coast sawmills and soon became commonplace.

The increased emphasis on volume was reflected in the increasing proportion of commodity dimension lumber produced by the industry. By the late 1970s, about 50 percent of Coast sawmill production was being shipped in dimension grades. To some extent, increasing capital intensity and economies of scale were accompanied by labour productivity increases which occurred during the early 1960s. From the mid-1960s to the early 1980s, however, average labour productivity remained approximately constant in Coast sawmills (Figure Eight).

In contrast to the Interior, which continued to show increases in labour productivity and economies of scale into the 1970s, the coast mills did not show the same improvements in efficiency in that period and gradually became less able to compete in the dimension lumber markets of the U.S., especially given the growing supply from the U.S. south. In addition, average quality of the Coastal log supply was gradually diminishing with the disappearance of the stands of huge Douglas-fir on the eastern side of Vancouver Island. Nevertheless, 1978 and 1979 represented record years for lumber shipments from the Coast in terms of both value (Figure Four) and volume (Figure Three). This was mainly due to a peak in demand as can be seen from the fact that prices were also at record highs at that time (Figure Five).

In 1981, the lumber industry entered a prolonged recessionary period. United States housing starts declined sharply and prices fell steadily from peak levels in 1979 while the cost of capital soared. By 1982, many analysts were referring to the Coast lumber sector as a "sunset industry".

The industry faced a dilemma. As the Coastal AAC had already reached its maximum, there was a constraint on wood supply and thus total value of shipments was not likely to grow through volume increases, however efficient the mills. Furthermore, many of the existing mills were old with obsolete equipment incapable of dealing efficiently with an increasing proportion of logs of both smaller size and declining quality. Furthermore, markets had to be diversified to reduce dependence on the United States construction industry.

The only way to increase profit margins without increasing the value of the output mix would be to pay less for inputs such as raw material or labour. The reality was rising wood costs, relatively high fixed capital costs and labour rates which were inflexible downwards, each acting to force down profit margins. The only possible solution lay in product diversification designed to process end products of higher value, provided this could be done at an added cost less than the additional revenue. It was
clear to most firms that the answer lay in restructuring to produce products of higher value destined for overseas markets in Europe and Japan.

The wisdom of this strategy was supported by market trends. For example, the price of clear lumber, which had risen steadily relative to other grades during the 1970s, took off in the mid-1980s (Figure Ten). The supply of high quality old-growth logs in the United States Pacific Northwest, which had been largely depleted on private industrial lands, was being further reduced by land withdrawals to meet environmental objectives on U.S. National Forests and increasing scarcity was forecast. Also, the reduction of the California redwood supply, due to logging and forest land withdrawals for other uses, increased opportunities to develop red cedar as an appearance wood.

Throughout the latter part of the 1980s, the coast industry, through investment, reorganization and market development, continued to increase the unit value of its shipments to offshore markets. This is reflected in Figure Five in the rising trend of unit values of Coastal lumber shipments since 1985 as compared to the Interior. It is also illustrated in Figures Eleven, Twelve and Thirteen, which show, respectively, the premium prices for shipments offshore compared to exports to the U.S. and the increasing trend in volume and value of offshore lumber exports from B.C. Although volume and value data by region of origin were not available, offshore exports come largely from the Coast. This increase in the unit value of shipments was accomplished by the major companies through the recovery and marketing of higher proportions of shop and clear lumber grades and producing a wide spectrum of sizes to meet customer needs as described by Cohen (1991). The premium for grade is illustrated in Figure Ten. Some major companies developed the capacity to produce joinery sizes and grades, specialty remanufactured products and secondary wood products. The industry has increased its efforts aimed at expanding offshore markets and has become involved

in cooperative endeavours. As can be seen from Figure Eight, the coast industry has also increased labour productivity during the 1980s rather than labour intensity.

The present structure of the Coast industry, with respect to the allocation of the AAC, is summarized in Table One.

### Table One

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Thousand Cubic Metres</td>
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<td></td>
<td></td>
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</tr>
<tr>
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<td>16</td>
<td></td>
</tr>
<tr>
<td>4</td>
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<td>1948</td>
<td>26.3</td>
<td>2</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
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<td>4291</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Other¹</td>
<td></td>
<td>4400</td>
<td>2700</td>
<td>-</td>
<td>18</td>
<td>10</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Coast Total</td>
<td>25000</td>
<td>27000</td>
<td>-</td>
<td>100</td>
<td>100</td>
<td>108</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Situation After Implementation of Commission's Recommendations²

| 5 | Pulp | 13417 | 13925 | 95 | 54 | 52 | 56 | |
| 2 | Large Lumber | 1543 | 4085 | 38 | 6 | 15 | 16 | |
| 4 | Small Lumber | 256 | 1958 | 13 | 1 | 7 | 8 | |
| 21 | No Tenure | 0 | 4291 | 0 | 0 | 16 | 17 | |
| Other¹ | | 10000 | 2700 | - | 40 | 10 | 11 | |
| Coast Total | 25000 | 27000 | - | 100 | 100 | 108 | |

1/ Excludes log exports and pulp mill whole log requirements.
2/ Assuming no other changes

Source: Derived from FRC Background Papers Volume 5 (Navotka 1991)
Pulp mill wood requirements have not been included in the table. Since many Coastal pulp mills consume raw logs, the excess of AAC over timber requirements attributed to these firms would be altered if their pulp log requirements were included. Another demand on Coastal timber is the log export trade. These two factors increase considerably the gap between timber requirements for all Coastal solid wood processing facilities and available AAC. The heterogeneity of Coastal logs with respect to species, sizes and grades provides an incentive for sorting and also trading. Cedar, particularly, has different processing requirements than other species. Log sorting allows specialist producers the potential to compete. However, both the timber requirements of mills operated by major integrated firms, and the appurtenancy conditions of licences, have resulted in log exchanges rather than log sales.

There are only two firms on the Coast without pulp capacity which have primary breakdown capacity comparable in volume to those with pulp mills, and one of these would be classified, on a province-wide basis, as an integrated firm since it has Interior pulp capacity. Exclusive of the one large lumber firm, there is more capacity in the remaining primary breakdown sector owned by those with no major tenures than by those holding timber rights, which in any case average barely 25 per cent of their timber requirements.

Table One also shows the distribution of the coastal AAC as it would be after implementation of the Commission’s recommendations for reallocation of the AAC, assuming other factors remained unchanged. Because of the high proportion of TFL timber among Coastal pulp firms, none of these firms would be reduced below 50 per cent of requirements. The two large lumber firms would drop to considerably below 50% of their requirements. The share of AAC not committed to major integrated or unintegrated processors would approximately double to 40 per cent.

The Interior Industry

The Coast lumber industry was well established by the 1950s when the Interior industry was just embarking on a path of continuous expansion that has marked its development throughout the following four decades. Prior to the 1950s the Interior lumber industry was comprised of over a thousand mills, many of them very small portable units, producing a variety of lumber products for export, domestic and local markets. On average, each mill shipped less that a million fbm per annum.

In the early 1950s the number of Interior mills was still growing. It reached a peak in the middle of the decade, then started on a steep decline reflecting the rapid changes the industry was undergoing. In the course of 15 years, the number of mills diminished from 1575 in 1955 to 300 in 1970 (Figure Six), while total shipments doubled from 2 billion fbm to 4 billion fbm (Figure Three). Thus, average mill size increased tenfold during this period from 1.3 million fbm to over 13 million fbm (Figure Seven). Concurrently, the number of workers employed stayed relatively constant at approximately 13000. Taken in conjunction with the increase in shipments this can be interpreted either as a doubling of labour productivity from 160 thousand fbm per employee in 1955 to 300 thousand fbm per employee in 1970 (Figure Eight), or a decline in the number of workers employed per thousand cubic metres of timber consumed from 1.3 in 1955 to 0.7 in 1970 (as can be derived from Figure Nine).

The major structural changes which the industry underwent were in response to the burgeoning demand for construction grade softwood dimension lumber in the United States. The changes were made possible by the increased timber volumes available in the Interior as reflected in the rapidly rising harvest levels depicted in Figure Two. Between 1950 and 1970 the Interior harvest grew fourfold from 6 million cubic metres to 26 million cubic metres. Furthermore, the changes were facilitated by
public policy with respect to timber allocation and access provisions. Of particular importance was the introduction of the close-utilization policy in the early 1960s which allowed tenure holders to increase their AACs by one third if they agreed to utilize trees and logs to close utilization standards. In order to take advantage of this opportunity, mills had to have equipment capable of handling small logs efficiently - usually some kind of chipper head-rig and debarking facilities - and a contract for the sale of chips to a pulp mill. The ability to accommodate these increased capital requirements was facilitated by the tenure security provisions that evolved informally under the unofficial name 'quota'. The rise of these large capital intensive mills was accompanied by the demise of many small mills which were simply unable to compete against the high efficiency of the super-mills. Although the province did not see many gains from the increased efficiency in terms of higher stumpage fees, these gains did not accrue simply to capital but were split with labour through rising wages during this period. The overall result was a move towards greater concentration in sawmill production and integration between the sawmilling and pulp sectors.

Over the succeeding years, capital requirements in sawmilling continued to increase as the quest for profits and competitive advantage drove the industry towards mills of increasing capital intensity, employing the latest technology designed to improve recovery and increase linear throughput in order to lower unit production costs. Thus, average mill size in the Interior continued to rise dramatically, increasing by 16 million fbm in the period from 1970 to 1976, and by a further 16 million fbm after 1976 to reach 44 million fbm in 1985 (Figure Seven). This represented a scale factor of 3.5 times above 1955, compared to the fourfold increase on the Coast over the same period. It was only in the early 1980s that average mill size in the Interior actually overtook that on the Coast. Total shipments were still growing exponentially, increasing from the 4 billion fbm mark in 1970 to 10 billion fbm in 1985 (Figure Three).

However, the decrease in mill numbers slowed considerably during the 1970s and 1980s, averaging about 225 in the decade between 1975 and 1985 (Figure Six). Labour productivity doubled again in just 18 years, from 300 thousand fbm in 1970 to 600 thousand fbm in 1988 (Figure Eight).

The recession of 1981-82 had a major impact on the Interior, which is overwhelmingly dependent on United States housing markets. Shipment volumes fell from almost 8 billion fbm in 1979 to 6.6 billion fbm in 1982, and values from $2 billion in 1979 to $1.5 billion in 1982. In real terms the decrease in value was more drastic, falling from $1 billion to below $0.6 billion in constant 1971 dollars. However, recovery from the recession was rapid in the Interior and it was not followed by major industrial restructuring as was the case on the Coast. Shipments bounced back and, already, by 1983 their volume exceeded the previous high of 1979. By 1985 they surpassed the 10 billion fbm mark and have remained at approximately that level in the five years since. Demand peaked in 1987 bringing with it high prices, but although shipment volumes at 11 billion fbm, were almost 40 per cent higher than the previous peak of 1979, shipment values in constant dollar terms fell just short of the 1979 record.

Thus during the 1980s the increasing volumes produced in the Interior were unable to compensate for the fall in real prices for SPF lumber associated with falling demand (Figure Five). In addition, following the 1980 Forest and Range Resource Analysis, a new reality had to be faced in the form of limits to harvest expansion.

The Interior industry has as yet made little progress in the restructuring that will be necessary, in contrast to the Coastal industry. This is not surprising given the nature of Interior timber resources which are more homogeneous than the Coast in terms of species composition and size and do not lend themselves as readily to the production of such a wide range of products and grades. Furthermore, the Interior
industry was committed to relatively new, capital intensive, inflexible mills designed specifically to produce dimension lumber for the North American markets.

Although a number of the larger sawmills upgrade product value through sorting and some remanufacturing such as finger jointing, the production of remanufactured specialty products and secondary wood products in the Interior is mainly carried out by independent, generally small, manufacturers. One major company, West Fraser Mills Ltd., has established a secondary manufacturing facility - Quesnel Laminators - close to the company's sawmill site at Quesnel and at least two of the larger lumber producers are planning joint ventures in further manufacturing with smaller independent firms. Some Interior manufacturers are part of cooperative marketing endeavours, but overall there is far less activity in the value-added segment of the industry in the Interior than on the Coast.

Today, over 70 per cent of the volume but less than 60 per cent of the value of British Columbia's lumber shipments originate in the Interior (Figures Three and Four).

The present structure of the Interior industry is summarized in Table Two. In the case of the Interior the exclusion of pulp mill wood requirements does not have a significant impact on overall timber requirements since pulp mills there rely almost exclusively on by-product chips. There are, however, a few chip processing plants whose requirements are excluded from the overall total.

As can be seen from Table Two, there is a gap between timber requirements for all Interior wood processing plants and available AAC. This deficit is exacerbated by the nature of the sawmills classified by firm type as integrated with pulp, or non-integrated but large. These two groups, combined could consume all the available AAC and more. Their capacity has been calculated on the basis of two shifts a day but it is more economical for them to operate three shifts a day.

The economies of scale in Interior mills arise from the high ratio of fixed costs to variable costs. This means that once fixed costs are covered then the revenue from any additional output only has to cover variable costs. This is the mechanism which enables these large mills to pay much higher prices for logs provided by Category 1 loggers. Conversely, if fixed costs are not covered then these mills cannot afford to operate at all, they thus have a minimum appetite for logs, and if they are not fed this minimum they cannot survive.

In contrast, smaller producers have much greater flexibility both in the range of products they produce and the range of capacity over which they can operate profitably. They have a high ratio of variable costs to fixed costs. They cannot afford to pay a higher price for the inputs to increase their production level than they can for existing inputs. In the production of commodity dimension lumber such mills cannot compete with large scale, efficient mills, but, conversely they have an advantage in the production of more specialized lumber products. In contrast to the Coast, however, the premium for these specialized products has so far proved insufficient to allow these mills to compete for limited timber with the dimension mills.

Table Two also shows the distribution of AAC as it would be after the implementation of the Commission's recommendations. There is only one Interior firm holding a TFL with such a large volume that the grandfathering conditions affect the result.
### Table Two
Allocation of the Allowable Annual Cut: British Columbia Interior

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<td></td>
<td>Thousand Cubic Metres</td>
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<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
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<td></td>
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<tr>
<td>A. Situation in 1991</td>
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<tr>
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<td>Pulp</td>
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<td>19</td>
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<td>17242</td>
<td>72</td>
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<td>100</td>
<td>107</td>
<td></td>
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B. Situation After Implementation of the Commission’s Recommendations

<table>
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1/ Some category 2 processing plants are included here but some of these are committed entirely as they were not identified in the source.
2/ Excludes chip processing plant requirements.
3/ Assuming no other changes.

Source: Derived from FRC Background Paper Volume 3: Nawtika (1991)

Since no interior firms start from an AAC position which exceeds capacity requirements, all firms would end up with less than 50% of their requirements, providing there were no other changes. Some integrated firms in the Interior would actually end up with considerably less than is shown here if the calculation was based on their Coast and interior operations combined.

### Development of the Further Manufacturing Industry

The further manufacturing industry is not well documented in terms of its size and structure and the available historical statistics are incomplete and frequently difficult to interpret. The industry is made up of a large number of small firms - 565 according to the most recent study. Each firm, on average, has 21 employees and annual sales of 2.6 million dollars (McWilliams 1991). The industry is highly competitive and there is a natural reluctance on the part of participants to share information. Only in fairly recent years have trade associations been formed, mainly to represent the industry’s concerns in its dealings with both provincial and federal governments who have taken an increasing interest in the sector since the early 1980s. These include the Independent Lumber Remanufacturers Association (founded 1979); the B.C. Wood Specialties Group (founded 1989); the Interior Value Added Wood Association (founded 1991) and the Interior Category 2 Wood Processors Association (founded 1987).

Statistics Canada data on further wood manufacturing are published under several SIC 3-digit and 4-digit classifications within the major Wood Industries (SIC 25) group. However, this group does not include furniture manufacturers which are reported under Furniture and Fixture Industries (SIC 26). Wooden Household Furniture, for example, is SIC 2611. What has been referred to in our classification of.
the industry as lumber remanufacturing does not have a separate SIC number. Rather, this segment of the industry is included in several other categories.

Tables Three and Four provide a composite picture of the development of the further manufacturing industry from 1982 to 1991 using figures drawn from several sources. The remanufacturing segment of the industry appears to have expanded during this period. This growth was largely based on the development of export markets. Secondary manufacturing, which mainly serves domestic markets, does not appear to have followed the same upward trend.

**Table Three**

*Estimated Size of the Lumber Remanufacturing Industry 1982 - 1991*

<table>
<thead>
<tr>
<th>Sources</th>
<th>Year</th>
<th>Number of Plants</th>
<th>Number of Employees</th>
<th>Shipments Value</th>
<th>Value of Shipment</th>
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<td>1982</td>
<td>75</td>
<td>1800</td>
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<td>455</td>
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<td>Nelson (1986)</td>
<td>1986</td>
<td>65</td>
<td>1662</td>
<td>990</td>
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<tr>
<td>McWilliams (1991)</td>
<td>1991</td>
<td>150</td>
<td>3470</td>
<td>710</td>
<td></td>
</tr>
</tbody>
</table>

1/ Includes wafer board and particle board but excludes the furniture industries.

**Table Four**

*Estimated Size of the Secondary Wood Processing Industry 1982 - 1991*

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Number of Plants</th>
<th>Number of Employees</th>
<th>Value of Shipment</th>
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<td>418</td>
<td>6180</td>
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<td>1984</td>
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<td>577</td>
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<td>1987</td>
<td>495</td>
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<td>McWilliams (1991)</td>
<td>1991</td>
<td>415</td>
<td>8190</td>
<td>830</td>
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¹ Includes wafer board and particle board but excludes the furniture industries.
Figure One
Coast Harvest Volume

Figure Two
Interior Harvest Volume

Figure Three
B.C. Lumber Shipment Volume 1961-1980

Figure Four
B.C. Lumber Shipment Value 1964-1986

Figure Five
Unit Value of Lumber Shipments 1964-1986

Source: Lelch (1992) derived from B.C. MOF Annual Reports.
Figure Ten
Trends in Real Prices for Douglas-fir Lumber

Source: adapted from Olivetto (1987).

Figure Eleven
Unit Values For B.C. Lumber Exports

Source: derived from Forestry Canada and COFI data.
In this section, some basic economic theory will be presented which will provide a framework for the analyses carried out in the remainder of the report. It will also assist the reader in understanding the economic forces which play a major role in determining the development of the wood products sector, particularly with respect to the industry's product profile, and will offer preliminary insights into some of the important issues facing public policy analysts.

**Distribution of Economic Output**

Economic activity transforms society's resources into goods and services which are demanded by consumers and have value. An appreciation of how this value is distributed, or shared, between the owners of the various inputs which contribute to its production is a useful starting point in gaining an understanding of the productive process and the economic imperatives which drive firms to choose a particular manufacturing technology or produce a certain type of product.

In simple terms, Figure Fourteen illustrates how the value produced by a firm operating in the wood products sector is distributed. The gross value of all products produced by the firm, which is represented by the size of the pie, must cover the costs of materials (including wood and energy), labour, capital, profit (without which a firm would not take the risks necessary to stay in business), and taxes.
What is Value Added?

The value added by a firm or, in aggregate, by an industry, is the residual which remains after the costs of all material inputs have been subtracted from the total value of production. For a firm in the wood industry:

\[
\text{VALUE ADDED} = \text{PRODUCT VALUE} - \text{COST OF MATERIALS (incl. WOOD)}
\]

Referring back to Figure Fourteen, it can be seen that the value added is the margin available to compensate labour and capital, provide a profit and meet tax obligations.

Value added, although it has a very precise meaning to economists, is a term which is used loosely and often inaccurately by others. Public sector policy analysts sometimes measure the performance of an industry in terms of its value added, the perception being that the greater the value added the more efficiently a firm or industry is utilizing its raw material inputs. In fact, higher value added does not equate with greater efficiency. As is evident from Figure Fourteen, greater efficiency requires that the total size of the pie, which represents the gross value of production from a certain quantity of raw material and other inputs, is increased. Increased value added may result simply from a redistribution of the total available product value. For example, the returns to labour in the form of wages may increase at the expense of returns to wood, as measured by stumpage or log values. The difference between efficiency in production and the distribution of the value produced is an important distinction in public policy analysis and one which we will return to later in this report.

It is also common practice to equate value added with more highly manufactured products involving more labour intensive methods of production. Higher value added may result from a capital intensive process such as the production of laminated veneer lumber. In this case a higher proportion of the value added will be in the form of profits and less will accrue to labour as wages.

The most common misconception is to equate high value added with a high return on the raw material or high value of the raw material. This is particularly exemplified by log exports. These can yield the highest value for the raw logs, and often a high margin for the operator in terms of the difference between costs added and value added. But the value added to the log through export is usually less than that added in domestic processing except in the special circumstances when the export price for the log is actually higher than the price of the lumber that domestic processing of the log could provide. However, even though less value added is usually generated by exporting a log than by domestic processing, this does not make log exports economically inefficient. The domestic processors may be unable to add value to the log
unless they can obtain the log for a price that allows the costs of conversion to be covered by the revenue received for the converted product.

Why Do Firms Choose to Manufacture a Certain Mix of Products?

Firms pursue maximum profits. This goal may be constrained by other objectives such as growth in sales, market share or protection of shareholders equity but, nonetheless, profits are the most important force underlying each firm's choice of what products to produce and how to produce them.

Profit is simply:

\[ \text{PRODUCT VALUE} - \text{COST OF MATERIALS} - \text{COST OF LABOUR AND CAPITAL} - \text{TAXES} \]

Firms choose that combination of outputs, inputs and processing technology which, they believe, will maximize their profit margin. That is, they adopt strategies designed to maximize their share of the value added. If a firm changes the mix of products it produces - for example towards a greater proportion of more highly manufactured products - it does so because these changes improve profitability, not because they increase the gross value of the products produced from available raw material or increase total value added. An example will illustrate this simple but important point:

<table>
<thead>
<tr>
<th>STRATEGY A</th>
<th>STRATEGY B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Value</td>
<td>$150</td>
</tr>
<tr>
<td>Material Cost</td>
<td>$50</td>
</tr>
<tr>
<td>Value Added</td>
<td>$100</td>
</tr>
<tr>
<td>Labour Cost</td>
<td>$50</td>
</tr>
<tr>
<td>Capital Cost</td>
<td>$20</td>
</tr>
<tr>
<td>Profit Margin (pre-tax)</td>
<td>$30</td>
</tr>
</tbody>
</table>

Although Strategy B results in higher product value and higher value added than Strategy A, it also adds costs in the form of higher labour inputs and, since it reduces the profit margin available to the firm, will not be adopted.

Many factors may stimulate a firm to seek products of higher value or adopt new processing methods. A decrease in the market value of the products it currently produces, or an increase in raw material prices, for example, each reduce value added and cut into a firm's profit margin. The firm might react to this new situation by trying to reduce production costs per unit of output (i.e., make more efficient use of capital and labour inputs). This might be accomplished by adopting new technology and/or increasing the scale of operation. Such a strategy could, and frequently does, reduce labour inputs. Or, the firm might try to increase the market value of the products it manufactures. However, the course of action the firm chooses will be the one which provides it with the highest profit margin.

Thus, because a product is subject to a higher degree of manufacturing and, therefore, is considered a more "desirable" industrial output in that it production contributes more "value added" to the economy, does not mean that it provides firms with the necessary incentives - higher profit margins - to produce it. It also may not
provide a sufficient residual to compete with other less value added products for the raw material. That is, it may provide lower not higher stumpage.

Public Objectives

Governments have their own goals and, given their primary concern for the welfare of the society they represent, it is not surprising that these are usually different to the goals pursued by the private sector. In jurisdictions such as British Columbia, where forest resources are publicly owned, governments are generally concerned about the magnitude of financial returns to public timber resources and that the number of people employed in timber harvesting and processing is maintained at an acceptable level.

The return to timber resources (which economists refer to as economic rent) is:

\[
\text{PRODUCT VALUE} - \text{COST OF NON WOOD MATERIALS} - \text{VALUE ADDED}
\]

Returns to timber owners (private or public) depend, to a great extent, on the characteristics of the markets in which the resource is sold. It is generally accepted among economists and increasingly among public policy makers in British Columbia, that competitive timber markets will tend to maximize resource values and encourage efficiency in the harvesting and processing sectors. In competitive markets, buyers, in competition with each other for a limited resource, have strong incentives to choose the product mix and processing technology which maximizes the price they can pay for timber while maintaining acceptable profit margins. Such arrangements encourage efficiency by ensuring that the value of the product mix is as high as possible given the constraints imposed by available technology, the costs of labour and capital, and acceptable profit margins. It should be emphasized, however, that such arrangements will not necessarily satisfy the employment goals of government, nor are they designed to do so. In the competitive markets described, the amount of employment created is incidental to a decision making process driven by a goal of greater efficiency. For a given product value, the lower the value added the higher the return to the resource. Private sector firms in pursuit of acceptable profit margins, have strong incentives to economize on the use of both labour and capital. How much labour is used relative to capital will depend on available technology and levels and trends in wage rates relative to capital costs.
TIMBER ALLOCATION, INDUSTRY STRUCTURE AND PRODUCT MIX

The major focus of this study is the interrelationships which exist between timber allocation, forest industry structure and the mix of products produced. In this section, following a general analysis of the factors underlying the product mix of the solid wood products sector in British Columbia, these relationships will be explored in more detail with specific reference to the development and current conditions which prevail in the Interior and on the Coast of the Province.

DETERMINANTS OF THE PRODUCT MIX

As explained earlier, firms in the forest industry, as in any industry, choose that combination of outputs, inputs and processing technology which will, in their opinion, maximize their profit margin. That is, they adapt their strategies to the environment in which they operate in ways which increase their share of the value added.

Any change in a firm's environment, either as a result of changes in the market place for outputs or inputs or as a result of public policy, may cause a firm to modify the mix of products it produces. A decrease in the value of its product mix will encourage a firm to seek ways to reduce production costs and/or increase product values in order to maintain its profit margin. Similarly, an increase in costs will cause comparable reactions.

How firms in the solid wood products sector in British Columbia would react to a change in timber allocation policies resulting in free market access to timber supplies depends on a number of important factors. These are described below.

First, producing a higher proportion of products that sell for a higher price is only an option if those goods can actually be sold. Thus, constraints imposed by market conditions have to be considered in assessing firms' behaviour.

Second, the production of higher value products almost invariably involves additional capital and labour costs, that is value added is increased. However, as discussed earlier, ignoring non-timber materials, the difference between the value of output which represents the gross return to the processor and value added is the residual, or stumpage, that can be paid for timber inputs. Thus, firms will only shift production towards the manufacture of any product if the revenue it generates exceeds the total costs of raw materials and labour and capital inputs by the amount necessary to provide an acceptable profit margin. Any product which fails to meet this requirement, from an individual firm's perspective, will not be produced. Even if a product does meet this criterion, it may not be produced if there are more profitable alternatives. The optimum product mix, as far as a firm is concerned, is the one which maximizes its total profit margin. Thus, the availability and costs of the capital, labour and material resources required to produce more highly manufactured wood products are important considerations.

A third consideration concerns type and scale of technology chosen. At present there are many small wood products firms manufacturing products of higher value in British Columbia. Not only are these firms and plants much smaller in scale than the primary commodity producers, they also employ more people per cubic metre of timber consumed. Thus, we must ask whether there are technical, or other, advantages to small scale and labour intensive technologies in the production of more highly valued wood products.

The fourth consideration is the condition of access to timber. Under the current system, access to timber is largely determined by public policy. Since this is a
discretionary system, not all processors face the same conditions in terms of price and access to timber. In addition, timber availability to primary processors means logs, but to remanufacturers and secondary processors it means lumber. These facts must be considered when assessing the potential impacts of policy changes. Processors, with some form of Crown timber rights, can be classified as follows:

- Major tenure holders, who hold quota in the form of long term tenures, and pay stumpage at appraised rates. They pay their own silviculture costs though these are taken into account as a cost in the calculation of appraised stumpage. They are expressly excluded from SBFEP sales.

- Owners of primary breakdown facilities who hold Category 2 small business sales obtained through competitive bidding. This category exists only in the Interior. They pay stumpage at a rate above appraised value by an amount equal to the sum of their bonus bid plus a silviculture levy.

- Owners of remanufacturing facilities who hold 16.1 sales obtained through the bid proposal programme. There is a bonus bid component in stumpage since these are awarded competitively, but the main criterion on which the competition is determined is the amount of value added generated by the proposed manufacturing facilities.

- Owners of integrated primary breakdown and remanufacturing facilities who hold 16.1 sales obtained through the bid proposal programme.

We are particularly concerned with the impact of timber allocation policies on the competitive position of smaller firms. Can such firms compete successfully for raw material against larger, more capital intensive firms if, particularly, the programmes which provide them some measure of support are abandoned?

The response of firms to questions concerning current policy and their attitudes towards policy changes, depend a great deal upon their current circumstances. These disparate viewpoints do not imply conflict, rather they represent varying opinions on the same problems as seen from different perspectives.

In the remainder of this section, the questions posed above will be addressed. This discussion relies heavily on the information gathered during the course of interviews with representatives of the individual firms and industrial organizations described in Appendix Two. Conditions common to both Coast and Interior are discussed first, followed by separate analyses for the Interior and the Coast.

HIGHER VALUED PRODUCTS AND MARKETS

One of our interviewees summed up the importance of markets as follows:

"The market place is the ultimate determinant as to how much value you can add. The higher the product value the closer to market it is better to produce it."

The first distinction to be made in examining the potential for products of higher value is between those that can be produced in primary breakdown and those that involve further manufacturing in separate facilities.
Adding Value in Primary Breakdown

In primary breakdown the unit value of the output varies with the size of lumber produced. A generic 2x4 has less value per cubic metre than a board which requires extra cutting, since boards are 1 inch thick or a wider dimension piece such as 2x12. Changing the size of the output involves additional costs and, thus, is a value added activity. However, as pointed out above, it will only be engaged in if the end product price is raised sufficiently to cover the increased costs.

Another value adding activity that can be performed at the primary breakdown stage is separation of logs by species. There are certain markets which have a preference for certain species and there is, therefore, a premium to be had for separating logs by species before processing. There are costs involved and, again, the extra value will only be added if the premium obtained for doing so exceeds the added costs.

A third type of value adding activity that can be performed at the primary breakdown stage is separation of lumber by quality - the process known as grading. Sorting for grades is worth doing provided the increased price covers the cost of the sort.

Lumber value can also be improved during the primary breakdown process itself. This may involve a trade-off between the premium obtained for width and the premium obtained for grade, since high grade clear wood should not include either the juvenile core of a log or any exterior knots.

In each of these cases the premium is affected by the price of both the regular output and the higher value output. The necessary premium to justify the additional cost may arise from either an increase in price of the higher value alternatives or a drop in price of the regular output mix.

Because of British Columbia's relatively low population, the provincial forest products industry is heavily dependent on the export market. Different markets demand different products since standards for sizes and grades are region dependent. Within the North American market the premiums for various sizes and grades are well known. The size of the market, however, gets considerably smaller the higher the grade, and price could thus be affected by a sudden increase in supply. A different set of sizes is required for the Japanese market where, in addition, there is much more emphasis on both quality and species. This is also the case for European markets.

The domestic remanufacturing industry is also a customer of the primary lumber producers. This sector has a preference for lumber sorted by species and by sizes and grades that are not standard to North American commodity lumber markets. While this market accounts for 60 per cent of domestic lumber sales in British Columbia and 11 per cent of total shipments of the provincial lumber industry, it cannot be regarded as competitive in the sense of having a large number of buyers and a large number of sellers. Instead, it could be classified as a contract market since the consumer has to negotiate for a certain amount of a specific product. Under these circumstances, the premium is determined by the seller according to an estimate of the additional costs involved in doing the necessary sorting.

A further option for primary mills is to have some of their output upgraded by a custom remanufacturer. This has the disadvantage that the seller, who is dealing directly with the customer, does not have control over the actual production process since it is being done by a contractor. An extra level of transactions is thus involved.
Adding Value in Remanufactured Products

The remanufacturing sector produces a wide range of products as described in an earlier section of this report. With the exception of products such as finger jointed lumber or MSR lumber, the products of the remanufacturing sector cannot be described as commodity products. The specifications of the product thus depend on the market for which it is destined.

Since our small population limits domestic demand, this sector must also seek export market opportunities. The fact that British Columbia is a considerable distance from most final markets has two implications. It is generally agreed that the more specialized a demand the closer to the final customer the product should be produced. There is an information cost imposed by distance. In addition, the smaller size of shipments and the need for careful handling and packaging increases unit transportation costs above those for commodity items. Thus, we compete as a marginal producer of further manufactured goods.

The main North American market for remanufacturers is to retailers who supply do-it-yourself items to end users. However, the major markets targeted by the remanufacturing industry are the offshore markets with particular emphasis on Europe and Japan. The products demanded by these markets are very different but they share the characteristic that a very high premium is put on quality. The premium on quality can be considered to equal the entire price of the item in fact, since a market does not exist for low quality products. Species, size and grade are all important, with variations in regional preferences.

The physical characteristics of the product are not the only attributes demanded by the market. Service is also part of the package, and this involves prompt delivery and also continuity of supply. These are markets in which product differentiation is possible and where premiums are attached to brand name products. There is also loyalty to a proven supplier, up to a certain price difference at least.

There are various cooperative industry and industry-government initiatives in place to facilitate and enhance market opportunities for B.C. and Canadian remanufacturers. These include the long-established Cooperative Overseas Market Development Programme (COMDP) and the recently initiated Cooperative Industrial Market Development Programme (CIMDP) of the British Columbia Wood Specialties Group.

INPUT COSTS AND AVAILABILITY

Capital

There was general agreement among those interviewed that there is a direct correlation between access to capital and security of raw material supply. Independent primary processors confirmed this in explaining that one reason they wanted access to quota for themselves was to obtain financing for upgrading. Existing tenure holders with primary processing facilities confirmed this through the doubts they expressed concerning reinvestment to update facilities in light of quota reductions. They saw the reduction in their quotas to provide timber for 16.1 sales as taking away their stability and reducing the likelihood of either existing owners or banks putting money back into mills.

From the perspective of those who received the 16.1 sales the security of supply offered by them was seen as a considerable asset. There has been considerable demand for them as they offered the chance for new entrants to attract the necessary financial
support for their ventures. Furthermore, existing operators who received 16.1 sales said they had expanded their operations as a result.

As far as access to capital for the financing of remanufacturing projects within large integrated firms is concerned, a different problem was encountered. They have the raw material available, provided the supply cost can be met, but often the scales of the projects are too small to be considered worth the transactions costs that are involved in getting approval for such capital expenditures through the various administrative strata of large corporations.

Labour

There is a difference in perspective with respect to labour costs between major tenure holders with primary breakdown facilities, who are interested in investing in remanufacturing facilities, and the smaller existing remanufacturing plants. Within the primary processing sector there is industry wide bargaining between member firms and the union, and it appears that non-union firms, or individual non-union plants within firms, also pay union rates.

At present, the remanufacturing sector is more labour intensive and less high-tech than the primary sector. There are thus more semi-skilled jobs as compared to the technically skilled labour required in a large modern sawmill. The large firms, who already employ union labour in their primary breakdown plants at rates which reflect the high labour productivity of these capital intensive plants, feel that they would be forced by unions to pay comparable rates in remanufacturing facilities and that this would put them at a disadvantage compared to smaller existing operators whom, they believe, are not unionized.

On the other hand, there are unionized remanufacturers, as well as remanufacturers integrated backwards to primary processing facilities, who have negotiated their own labour agreements. In fact, a 1988 study (Deloitte, Haskins and Sells) found labour rates in the primary sector ($15.99 per hour) to be only marginally more than in the remanufacturing industry ($15.41 per hour). As the remanufacturing sector expands, there will be pressure for employees to become more organized. Workers in British Columbia have come to expect an income which allows them a high standard of living. Independent firms view their major competition as plants situated south of the border where wage rates are generally lower. Their perception was that large integrated firms would be more likely to set up remanufacturing plants there to take advantage of low wages.

Unions represent a distortion from pure competition in the labour market, as indeed do minimum wage guidelines. In order to produce remanufactured goods at a competitive cost using labour intensive technology it is necessary either to lower wages or to reduce other costs. Paying a high wage certainly represents an increase in value added, but if the end product price is fixed then this can only be done at the expense of the price which a manufacturer can afford for materials, including timber.

The alternative is to develop higher tech production processes. There is some cooperative research underway in this direction. Sophisticated technology requires more highly trained employees and there are some retraining efforts underway. A more highly educated workforce has indirect benefits for the public but it does nothing to address the issue of raising the level of employment in the forest industry sector.
TECHNOLOGY TYPE AND AVAILABILITY

Availability

There appeared to be general agreement, among those interviewed, that the technology available to B.C. producers is competitive with that available elsewhere. One person put it this way: "On tour in Germany I didn't see anything we don't have."

Related to this question is the ability to make best use of the available technology. This concerns both the quality of labour, as has been discussed above, and the quality of raw material being processed. This latter point is discussed in a later section on raw material availability.

Type

There was no single answer to the appropriate scale of technology for production of higher valued products. It was generally agreed that secondary manufacturing required small scale. This was at least partly due to the need for quality control and the shortest distance for direct communication between production workers, decision-makers and those who deal directly with customers.

With respect to the appropriate scale for producing higher valued output in the primary processing sector there was a distinction between Coast and Interior. On the Coast, firms with large mills felt they had both a timber access and cost advantage and as much flexibility as smaller mills. In the Interior, large mills were viewed as handicapped in the production of higher valued products through lack of flexibility.

A related consideration is the degree of process integration necessary to produce specialty high-valued products. It was argued by some experienced remanufacturers with their own primary breakdown facilities, that they actually began the process of raw material selection for their end product in the woods. Species selection is involved, and also log bucking to specific lengths. From there, the specialization continues through primary breakdown in the choices of sizes and grades cut.

TIMBER ACCESS

The relevant question with respect to availability of raw material is whether the constraint is a matter of price or is there an absolute constraint on access to raw material at any price. To address this question it must be further analysed according to raw material type and purpose. Primary breakdown sawmills, which produce specialty further manufactured products, require access to raw logs. The raw material required by remanufacturers is lumber. Lumber producers who supply remanufacturers require logs and remanufacturers who are integrated backwards into primary breakdown also require logs. In some specialized cases it could be argued that sorting for value added has to begin with the standing timber, as once a log has been cut and put on the market it may have already lost value through being the wrong size.

There are different access problems in each of these categories between the Coast and the Interior. However, the Small Business Forest Enterprise Program is Province-wide, with the exception of Category 2 sales which are found only in the Interior. It is accepted that Category 1 sales have been successful in increasing stumpage revenues for the government through a competitive bid process, the timber going to the highest bonus bid. However, it is also accepted that this market timber has not significantly reduced any entry barriers faced by value-added primary processors.
nor encouraged any primary processors to enhance their product lines in ways which make them more accessible to secondary processors. In the Interior and on the Coast, most of the logs from Category 1 loggers are purchased by the major tenure holders or, in the case of the Coast, end up in the log export trade.

In contrast, there is almost unanimous agreement that 16.1 bid proposal sales have resulted in increased access to lumber for remanufacturers. Most of this timber was taken from the quotas of primary processors, and in most cases it is they who actually log and process the timber from the 16.1 sales. Access to the timber has apparently been the key to making it worth while for the majors to do business with the remanufacturing sector. This timber came out of the 5 per cent reduction of major holders’ AAC in 1988. Through the mechanism of the bid proposal sales, not only has a source of raw material been opened up for the remanufacturing sector, but also stumpage revenue to the Province has increased since sales are above appraised stumpage, though generally not as high as the Category 1 bonus bids. 16.1 sales to primary processors producing specialty products and to those small primary processors who have traditionally supplied the remanufacturing sector appear to have been a minor fraction of the programme.

Section 16.1 is recognized as an explicit affirmative action programme which provides help to remanufacturers in two distinct ways. It provides some security of supply which can be used to get financial backing and also to reassure potential customers. Second, it provides remanufacturers with access to the lumber they require. Since this lumber comes from the majors, it is not entirely clear why it was not available prior to the 16.1 programme. The main reason usually given concerning the lack of accessible lumber for remanufacturers is that the barrier is price. However, we were assured by participants in the programme, both major and independent, that when access to timber from 16.1 sales is traded for lumber, the remanufacturers concerned are getting no special price concessions on their raw material. On the other hand, those established operators whose raw material supply was displaced by the new entrants under 16.1, assert that newcomers are being subsidized in some way and would not in fact be able to compete against their hard won experience on a level playing field. In addition, they suggest that the programme may not be enhancing the further manufacturing sector but merely displacing established processors.

Thus, while the concept of 16.1 is generally applauded as a means of helping the immature remanufacturing industry, there is less enthusiasm for its actual implementation. A particular concern was that many of the proposals are not yet off the ground and that this, effectively, freezes the allocated timber and correspondingly reduces the overall available AAC.

The implications are that, quite distinct from any perceived allocation barrier to the expansion of the further manufacturing industry in British Columbia, there is an economic barrier - a cost barrier - in terms of affordable price for raw material. The high speed, high volume commodity mills are seen as a product of earlier timber allocation policies. The quota system, leading to long term, replaceable forest tenures, was the driving force that enabled capital investment in these large efficient mills. An additional factor which enabled the development of the existing industry was subsidized access roads which expanded the economically accessible limits to timber harvesting.

One interviewee put it this way:

"Years ago we gave section 88 and stumpage rebate for roads into the forest. now the roads we need to build are those to the markets and they cost a lot, and we need help to build them."
THE INTERIOR

HIGHER VALUED PRODUCTS AND MARKETS

Adding Value in Primary Breakdown

In the Interior, sorting by size, grade, and species does not yield premiums as high as those obtainable on the Coast because interior logs are more homogeneous. The premiums do exist, however, and if they can be profitably obtained they represent a way of adding value.

Log sorting is much less common in the Interior than on the Coast because most of the wood that is harvested is a mixture of spruce, pine, and fir. These can go through a sawmill interchangeably without affecting the process settings and are usually sawn and marketed as a single species mix - SPF. Interior logs are also usually of more uniform dimensions than Coastal logs. There are premiums to be had in certain markets which show species preferences. However, given the scale and speed of the commodity processors, the costs involved in separating logs by species before processing have tended to outweigh the premiums.

Interior dimension mills usually include huge J-bar sorters which deposit different grades and sizes into separate bins. The size range is usually limited to those produced for the North American market. The premiums for various sizes and grades within this market are well known.

For various reasons, relating mainly to the proximity and the traditional high demand of the North American market, sawmills in the Interior have not varied their output spectrum to include sizes and grades suitable for offshore markets. Because of the current decline in the North American market, and especially the decline in prices for commodity lumber, this could begin to change in the Interior and mills there may follow those on the Coast and start cutting for Japanese and other offshore markets. This is likely to be the case when facilities require replacement or renovation.

Different sizes than those of dimension lumber are also usually preferred by remanufacturers. As yet, there does not seem to be any move on the part of large interior primary operators to seek out a market for specialty sizes and grades among remanufacturers. Changing to the standards for a different region requires a more complex intervention as the settings for the breakdown process have to be altered. The unit cost of doing this escalates if only small quantities are demanded. Individual remanufacturers thus find the prices charged are beyond their ability to pay, while primary producers say the demand is insufficient to provide premiums to cover the costs. In addition, the custom remanufacturing sector is not nearly as well developed in the Interior as it is on the Coast.

In contrast to the large processors, whose lumber is mainly destined for export, the very small processors who qualify as Category 2 registrants sell most of their lumber locally. Some of this is a continuation of the traditional market of the pioneer mills of the Interior - supplying directly end use local customers such as farmers. But the market for a considerable portion of the output of Category 2 sawmills is the lumber remanufacturing sector.

Adding Value in Remanufactured Products

The markets being targeted by the remanufacturing industry in the Interior are the same ones in which Coastal expansion has already begun. These are the offshore markets with particular emphasis on Europe and Japan. Because of the emphasis on
quality, there was varied opinion among producers about how far along the value add chain it is possible to proceed. Sorting for species and grade were viewed as value-add activities for which there was a strong demand, or at least for which a strong demand could be created through careful marketing. The tight grain of the slow growing interior species was generally viewed as a positive attribute of interior wood for these markets. However, remanufacturing beyond the point of blanks for joinery stock was seen as rather more difficult, given the physical distances to the customers served and, also, the cultural differences in understanding the type of craft work involved.

Most of the remanufacturers interviewed in the Interior did not see market demand as a problem or a constraint on expansion. Whether they could meet the conditions of the market at the market price, was a different matter. Our sample was, however, weighted towards small firms, well established in remanufacturing, who emphasized that they had started small in terms of production and had invested a lot of time in building a clientele. Some pointed out that getting a foothold in the market was a prerequisite without which the benefits provided by 16.1 sales of improved access to raw material and capital were of much less assistance.

A different perspective was taken by producers used to dealing with a different scale of operations. An example of the contrast in scale between dimension lumber production and remanufacturing, which is reflected in the perception of market size, was given by a representative of one large integrated firm that had recently invested in its own remanufacturing plant. The manager of this plant said that the project had started small but grew and is now bigger than intended. In a single product line it has an output of a trailer load a day (38-40m³). There is a good market for 50 percent of what is produced but poor markets for rest. This is in contrast to the US market for dimension lumber where everything produced can be sold.

Another example was given concerning the board market, which is considered to be a specialized value-added market. Many mills produce some boards but there is only one mill which specializes in board production and it is of intermediate size - small compared to dimension mills but large compared to remanufacturers. The comment was made: "Couldn't have 20 Gormans in BC. Market wouldn't be there."

Markets present extremely important constraints which are linked to transportation costs and British Columbia's position as a marginal producer situated far from major consumers. In addition to concerns about the high cost of transportation, there are also concerns about the riskiness of transportation due to the modest size of shipments. Most firms are unlikely to be producing sufficient volumes to fill a whole container at one time, not to mention finding customers interested in buying a whole container load. The service aspect is also important. Stores want to buy boxes not truckloads. Yet a product has to have considerable value to be worth shipping in small quantities. The deregulated transportation system in the US. it was suggested, offers an advantage to US competitors.

INPUT COSTS AND AVAILABILITY

Capital

The smallest operators, the Category 2 owners, stated that no lending institution would look at them because they did not have supply security. The remanufacturers pointed out that they had to give personal guarantees to the banks and got charged maximum interest rates. One well established integrated remanufacturer explained it as follows:
"The banks didn't feel secure with us. Most mills get financed because of quota. It helped when we started to bid on timber sales. That allowed the building of the present plant in 1984, the original one was much smaller."

Existing tenure holders in the Interior were particularly unhappy with reductions in quota that had already occurred and saw these as detrimental to the likelihood of either existing owners or banks putting money back into mills. There are several reasons for this heightened concern. First, overcapacity in the Interior is more severe than on the coast and the competition for available timber is more vigorous; second, firms in the Interior started from a lower level of captive supply than on the Coast; and, third, many feel they have property rights in quota because it has been purchased at a high cost from other operators rather than being awarded directly by the Crown.

Labour

There was some discussion of the different types of skills that were required in producing and handling specialty items. This is one area where it is perceived that more training of the workforce is required.

We did not hear directly in the Interior the complaint that British Columbia lumber is being shipped to remanufacturing plants in the US Pacific North West because of lower wage rates there. However, this was implied in comments that related to the availability of materials. It was stated that large integrated primary processors are shipping their output to remanufacturing plants south of the border in preference to selling to local remanufacturers. Implicit in this was that local remanufacturers could not afford to pay as much for their material input because of the value add costs of labour.

There was a strong feeling that workers in B.C. should be the ones to add value to B.C. timber. This was part of the rationale used by the small Category 2 operators in arguing the importance of their continued existence.

TECHNOLOGY TYPE AND AVAILABILITY

Availability

Among the specialty producers there was an implicit suggestion that craft was more important in the production of their goods than science. This was associated with a pride in workmanship and the idea that their technology was not inferior to that elsewhere.

Type

In the Interior, small, specialized, primary processors have the technical flexibility to produce variable quantities of diverse products but their unit costs are much higher than the highly efficient large scale primary processors. However, this is not true when a small quantity of a particular size is produced. When a high speed, volume oriented mill is asked to produce a small volume of a particular product, which differs from the normal mill run, the costs involved in making a special production run make it very expensive. The high efficiency of large mills is premised upon their being used at capacity because fixed costs make up a large proportion of total costs. Providing such mills are used at capacity, then small mills are economically inefficient by comparison.
However, as discussed earlier, as the premium increases between the price of commodity products and alternative outputs, driven especially by falling real prices for commodity products, then there is more incentive to produce a wider range of outputs. Flexibility then becomes a more valuable technological attribute. It is precisely this attribute which is offered by the small Category 2 primary processors, and which has allowed them to be the traditional suppliers of the remanufacturing sector in the Interior.

Given changes in market demand and limits to timber supply, industrial restructuring and technical changes will occur. More flexible mills may have different economies of scale. The problem from a public policy perspective is in managing the transition. However, it is end product markets and available technology rather than stumpage or log markets which will drive this transition.

**TIMBER ACCESS**

**Value Added : Primary Breakdown**

A very high proportion of the primary processing capacity in the Interior is dedicated to the production of dimension lumber. The current technology in these mills is very limited in its flexibility to respond to value-added demand. There is some established medium scale capacity which has been successful in finding and serving value-added niche markets. These mills rely on security of tenure and feel that a competitive market, as proposed, would be a hindrance rather than a help to them. For one reason, their ability to find the financial resources in order to keep up-to-date with technology would disappear with the loss of half their quota. In addition, they feel they would be unable to compete with the large timber hungry dimension mills. In particular, they would be disadvantaged with respect to integrated pulp firms who exert oligopsonistic power in chip markets. The low price paid for chips reduces the price that independents can afford for logs. Pulp firms, on the other hand, can incorporate chips at their true marginal factor values in pulp production rather than their internal transfer cost or at the price paid to independents. These considerations suggest that competitive markets would not reduce the barriers for new entrants in this field. The other type of specialty sawmills in the Interior are dedicated to production for their own remanufacturing facilities and are discussed in a separate category.

**Remanufacturers Without Primary Breakdown Facilities**

There seems to be a consensus that the raw material for remanufacturers is available at a price, but that the price is often beyond remanufacturers’ ability to pay. There is a distinction to be made between the various types of raw material remanufacturers are seeking. Some use the current output of the Interior dimension mills, assuming they are able to access it, but only a specific portion of the output rather than the whole profile. That is, they can use certain selected sizes, grades and species. Other remanufacturers require raw material of a size or quality which is not part of the usual output profile of the dimension mills. The size is often unsuitable in that it is too difficult to get a number of remanufactured items from it without considerable waste. An actual 2x4 rather than a nominal 2x4 is more desirable for the production of various secondary items, for example. In addition, the lumber used in remanufacturing often requires the use of different drying regimes to those used in dimension mills, which apparently dry for weight rather than quality. However, once dried, the lumber is very difficult to redry to the appropriate standard.
For remanufacturers who use the regular dimension mill output, their price will still be high unless they buy on the commodity market. The additional costs arise from the additional sorts that may be required for species and the generally small size of the order. In addition, both buyer and seller incur market information costs due to the small size of the market.

With respect to lumber that is not normally present in the output of a major primary mill, the necessary additional costs borne by a dimension mill to produce the required output are even higher. The small number of secondary manufacturers comprising the market for lumber in the Interior has three implications. First, it is hard to know what is a reasonable price. Second, and more important, a primary processor who produces a special run may suddenly find the market has disappeared. Third, the smaller the market the greater the unit cost, or cost premium, incurred in producing for, and selling to, small remanufacturers. One remanufacturer explained it this way:

"It is difficult for this industry to get its materials because it is so small. It is not recognized as a customer by the primary processors. The cost of doing an extra sort, or running a different size, at present simply isn't worth it for the majors."

The remanufacturers in the Okanagan clearly did perceive access to wood as a major problem and cited this as the major reason for forming the Interior Value Added Wood Association. One advantage of an association of remanufacturers is that they could possibly purchase the mill run, or whole profile, of a primary mill and do the sorting themselves. They describe the first priority of their association as follows:

"Adequate supply of affordable remanufacturable fibre through cooperation with the majors and Category 2 operators."

A further priority is to:

"continue to encourage remanuning in B.C. rather than export jobs."

Prior to bid proposal sales, the main source of supply for Interior remanufacturers was the small Category 2 primary mills. Although these mills supplied the sizes required at affordable prices they were considered unreliable at times from the perspective of the remanufacturers as they would sell where ever they were offered the highest price. Since the introduction of 16.1 sales, the remanufacturers have been less dependent on the Category 2 mills as they have a lever for negotiation with the majors. However, it is unlikely they would be helped by the demise of the small independent primary sector which would be the likely consequence of the Commission's proposals, as discussed below.

The 16.1 programme was seen as a positive step in helping the remanufacturing sector in its raw material problems. The recommendation that the bid proposal sales be converted into Resource Management Agreements was interpreted as equivalent to establishing quota for 16.1 and thus increasing their security of supply. There was little concern with the associated management provisions, probably because most 16.1 sales are not logged by the remanufacturer but by the major primary processor with whom they have an exchange agreement. Interior remanufacturers have the same criticism concerning 16.1 sales as Coast remanufacturers. The main drawback to bid proposal sales was seen in its implementation in that it appeared to favour new entrants over existing operators. This was seen as handicapping those who had got established without such help. They felt they were placed in an unfair position relative to the new entrants with respect to competing for available raw materials, and to a lesser extent in the product market. In the market place they felt more able to compensate any cost disadvantages by market knowledge and experience.

While 16.1 is viewed as having increased access for remanufacturers to lumber produced by the majors, Interior remanufacturers also see a new source of competition
for them in the growing trend of major, integrated firms to move into remanufacturing themselves, and in particular to establish those facilities south of the border in the United States. They do not feel they could be cost competitive with these plants.

The introduction of a more competitive markets for timber and logs is not viewed as likely to help the secondaries in terms of raw material availability since it seems unlikely to provide primary processors with an incentive to produce an output profile more useful and accessible to them. Indeed, it could be detrimental if the result was more concentration and integration of majors into remanufacturing plants located outside of British Columbia.

**Suppliers of Remanufacturers**

Two main sources of supply of lumber to remanufacturers have been discussed above - the large dimension mills and the Category 2 operators. They have disparate conditions of access to timber and different associated problems.

The large scale Interior dimension mills need a certain volume of throughput to be able to cover fixed and variable costs in order to operate at all. Once that threshold is passed, only variable costs need to be covered in the production of additional volume. This reduces the value added component of the cost of 'incremental' wood but increases the amount that can be paid for it. Almost without exception, these mills have timber appetites which exceed their timber quotas. The 5 per cent reduction in their quotas to establish the bid proposal programme further exacerbated this gap. The higher cost that can be paid for incremental volumes is reflected in the high bonus bids on Category 1 sales, the logs from which are destined for the plants of major producers. The competitive bidding that takes place for Category 1 sales pushes stumpage prices to the maximum difference between variable cost per unit and the revenue per unit earned on the incremental levels of output. The high demands of these mills is also reflected in the recent steep increases in the amount of private wood harvested in the Interior, the majority of it from unmanaged forest land.

Joint ventures, or exchange agreements, with secondary manufacturers in the bid proposal programme provided a way for dimension mills to recover some of the quota they lost. Due to the criteria which must be considered in awarding a sale, in addition to the amount of the bonus bid, stumpage paid on 16.1 sales is generally lower than that on Category 1 sales. This may allow major companies who gain access to this volume to absorb the extra costs of supplying small volumes of specially sorted products to their remanufacturing partners and still earn a satisfactory profit margin. This is the sense in which the 16.1 programme might be regarded as providing a subsidy to those in the remanufacturing sector with such agreements.

However, given the objectives of the 16.1 programme to promote the secondary industry through facilitating access to raw materials, some majors suggested that a direct approach might be better. One proposal was to return the quota to the majors on the condition that a certain volume of their output went to secondary manufacturers. One advantage of this from their perspective was to avoid the effective removal of timber from the AAC during the transition period while a new venture which had been awarded a bid proposal sale got its facilities up and running.

With respect to the Commission's proposals on timber allocation, the large mills were not any more optimistic about their potential to survive than anyone else. From their perspective, it is felt that there would be too much insecurity and that their shareholders might have less inclination to wait out the inevitable shakeout than the owners of local firms. From the perspective of nonintegrated firms, it is felt that the disadvantages of oligopsonistic chip prices would be exacerbated and they would not be competing on a level playing field even if their quota ratios were approximately the
same. There was general agreement that, by itself, competition would not produce more investment in value added. It was, however, also agreed that the next generation of sawmills in the Interior was likely to more flexible and somewhat smaller, but that this would be the result of product market factors.

The traditional suppliers of the Interior remanufacturing industry have been the small independent primary processors who rely mainly on Category 2 sales for their survival. Once typical of the sawmill sector in the Interior, they were probably saved from extinction by the introduction of the small business programme a decade ago. This sector of the industry has traditionally been least organized because it has been most independent and truly representative of the virtues so often associated with the entrepreneurial competitive spirit. In 1987, with changes to the SBEP in the wind - changes that eventually resulted in the introduction of the new programme on bid proposal sales - many of these operators, mainly located in the southern Interior, formed themselves into the Interior Category 2 Wood Processors Association.

Although it is part of their philosophy that they would like a true totally competitive market for timber, they consider that under the conditions recommended by the Commission they would be disadvantaged since they would not only lose their special category, but would also be competing from a base of zero quota against those with up to 50 percent of requirements. They do not argue that they are capable of processing timber more efficiently than the majors, but they do argue that they have a much greater incentive to produce the lumber required by the secondary sector. This is because their cost differential between producing dimension lumber and other sizes and grades is much less than that of the majors, and thus a much smaller premium in the selling price for these products is required to provide the economic incentive to produce them. They have the ability to be much more flexible than the large mills.

Category 2 sales are awarded on a competitive basis and yield an average stumpage price that is above appraised stumpage and probably above that paid under the bid proposal sales. In general, it is below the average price paid for Category 1 sales and thus few of the sales in the open category are won by Category 2 registrants in competition with category 1 registrants. Category 2 registrants process the timber from their sales, whereas most of the wood cut in Category 1 sales is processed by majors. These operators have consistently lobbied for a higher volume to be designated for Category 2 sales. They recognize there would be an economic cost in stumpage revenue foregone as compared to Category 1 but believe that the cost is justified in order to achieve social goals of forest policy such as higher employment and the encouragement of a diversified, value-added sector. They point out that they are currently more labour intensive than the majors, and that their employment generating ability is further enhanced by the secondary remanufacturers who are the customers for a significant proportion of their output.

Their analysis of the 16.1 situation is that this amounts to a further policy bias in favour of major licensees since the lumber ends up in their hands. They acknowledge it provides access to the lumber output of majors for secondary processors, but point out that this is, in effect, yet another case of the majors encroaching on their interests, in fact, on the one market which they have traditionally served.

Remanufacturers with Primary Breakdown Facilities

Those remanufacturers with their own primary breakdown facilities justify these on the grounds that it is the only way that they can obtain the particular input they require. They do not disagree with their critics who point out that their sawmills are not competitive with the larger mills and thus economically inefficient. Instead, they
argue that this is a necessary cost of producing the quality raw material required to achieve a high value added end product. Since they have their own primary facilities, these operators do not have supply agreements with the majors associated with 16.1 sales they hold and, thus, do their own logging. In general, they follow a European model for their operations as well as targeting European markets for their products. This involves starting the process of adding value in the woods and continuing in a sawmill with the flexibility and quality control necessary to produce a product appropriate for conversion to its eventual end use. Such facilities are the epitome of the high quality, further manufactured sector that most British Columbians would like to see established in their province.

It is unlikely these operators could survive in open competition. Even under the present 16.1 system current stumpage is too high for them. This may not be a fair reflection of their economic viability, however, because of the comparative value system used to calculate stumpage.

COAST

HIGHER VALUED PRODUCTS AND MARKETS

Adding Value in Primary Breakdown

Both the products and markets of the coastal primary processors are more diverse than in the Interior. There has always been some degree of specialization among coastal producers either in terms of species, or markets, or both. This reflects the far greater heterogeneity in species, size and quality found in coastal timber. Thus, there is great emphasis on the necessity of sorting at all stages in the production chain.

Historically the log profile of the coastal harvest was biased towards Douglas-fir. This reflected market preferences. The large number of cedar specialty mills is a traditional example of species segregation that still continues. Specialization, in this case, is related to the physical attributes of the wood both with respect to processing requirements and the type of products for which it is best suited. Mill specialization in other species such as hemlock has, in contrast, arisen mainly because of market preferences concerning such qualities as colour and grain. The development of hemlock as a desirable species was an example of proactive marketing in the search for higher values.

Specialization in species has promoted log trading. The ability to trade logs has been enhanced by the geographic features of the Coast. Most processing is done either on Vancouver Island or the lower mainland and the logs are transported there by water. Although most of the log trading is based on log for log exchanges there are opportunities for primary processors without timber to purchase logs on this market.

The need to be proactive in seeking out markets for specialty items is emphasized by all in the industry. Market information has value in such markets, in contrast to commodity markets where information has zero price because it is equally accessible to all. In the search for added value, information is as valuable in the log market as any other market and adds another barrier, in addition to those of scale and lack of logs to trade, for small processors seeking logs.

Following a period in which the coastal primary processing sector focussed its efforts on feeding the huge U.S. demand for dimension lumber, the industry has been restructuring to build markets offshore. There are several mills which have been built exclusively to serve Japanese lumber market. In order to be able to supply a product other than cants (baby squares for example), a good deal of flexibility is required. This is the attribute which is now central to mill design as it offers the potential to respond.
to diverse market requirements. Thus, it is in the primary breakdown, value added sector that some people see the greatest potential for growth.

The opportunities described above are clearly open to large integrated mills. However, it was pointed out that there may be other obstacles to such firms realizing this potential. First, as noted above, accessing capital for small projects in large corporations may present problems. Second, effective lines of communication between decision makers concerned with processing and those seeking out and dealing with customers may be difficult to achieve in large integrated corporations. It was pointed out that marketing requires a different corporate philosophy to the engineering or process oriented approach required for volume based commodity production. Attention to detail and the “personal touch” is more valuable than speed. Commodity products are “sold” not “marketed”.

Adding Value in Remanufactured Products

There was some suggestion that British Columbia may have already reached its limit in remanufacturing capacity relative to accessible market size. These perceptions vary depending on whether the perspective is the cost competitiveness of British Columbia producers or total market size. Part of the concern is that new producers, attracted by the bid proposal program, may not actually be expanding British Columbia participation in further manufacturing but simply displacing existing operators.

There was also the suggestion that the major part of the production of the present remanufacturing industry could actually be integrated into specialty sawmilling. In spite of the associated emphasis on specialty niche markets, this view was held by both a small mill and a major non-integrated tenure holder.

On the Coast, it would appear that a sizable proportion of the output of the remanufacturing sector is custom work.

INPUT COSTS AND AVAILABILITY

Capital

Although the importance of secure timber supplies for gaining access to capital was not disputed, it was not universally accepted that timber supply should be used as a mechanism for this purpose. This was in contrast to the Interior where almost everyone seemed to believe that they needed the security of some type of quota. Funds such as the recently announced Venture Capital Equity Fund were suggested as alternatives. It was, in fact, suggested that delinking appurtenant processing facilities from some existing licences would free up capacity presently being operated inefficiently, more effectively than removing quota and associated management responsibilities from current tenure holders.

An additional reason given for the reluctance of integrated firms to allocate funds to remanufacturing projects was other demands on their financial resources. such as requirements to upgrade pollution control capability in pulp mills.

Labour

There was considerable concern expressed by independent remanufacturers that it was becoming increasingly difficult for them to be cost competitive with rivals operating a short distance away, south of the border, with lower wage rates. Many feel that there is an increasing trend for British Columbia firms to relocate there.
TECHNOLOGY TYPE AND AVAILABILITY

The wider quality spectrum in Coastal timber provides higher premiums which, in turn, have the potential to encourage larger mills to be flexible and invest the extra cost in selecting for quality. There is also an incentive for smaller, primary processors to focus production on the higher end of the market. This suggests there may be a range in scale for economically efficient specialty sawmills on the Coast. The main attributes required are a willingness and the technical ability to be flexible, a disposition to sort and sort again to get the highest quality and knowledge of the markets available. An important constraint on large firms in this regard is that they have become increasingly integrated into pulp and still retain a commodity producing mentality in lumber. In some firms philosophies are changing but ingrained attitudes are difficult to overcome in large organizations.

TIMBER ACCESS

Primary Breakdown Remanufacturers

A high proportion of the value added activity occurring in British Columbia is in primary breakdown sawmills. A few of these are integrated with remanufacturing plants. In the Interior, there is little to differentiate the sawmills of integrated pulp firms from those of the unintegrated independents in terms of products, markets or proportion of captive timber. In contrast, the coastal integrated pulp firms have both more secure access to timber in the form of TFLs, compared to FLs, and a higher proportion of captive timber. In addition, there is much greater size diversity among Coastal sawmills. As pointed out earlier, following the recession of the early 1980s, most coastal firms reduced shipments to the U.S. dimension market and built new more flexible sawmilling capacity. There are some mills which are still specialized and thus constrained in terms of log size and species cut, but most coastal mills share an ability to adjust output in response to market preferences. They thus have the necessary prerequisite for value-added production.

There is a sizable proportion of primary processing capacity on the Coast with little or no dependence on long-term tenures. These mills would, presumably, benefit from any increase in market timber availability and this sector could grow. Whether any additional output from this source would be relatively more highly valued or more accessible to the further manufacturing sector is impossible to predict.

On the other hand, the Commission’s proposals would impact very differently, in terms of timber security, on the integrated pulp firms compared to the larger, non-integrated lumber producers. The specialized approach to marketing and production required for higher valued products is very different to that for a commodity product such as pulp. Thus, it may be better achieved by a non-integrated firm. Under the Commission’s recommendations such firms would be penalized relative to their integrated rivals. It was suggested to us that the pulp side of integrated firms is viewed by most of them as more important, and further, that the much larger capital investment associated with pulp mills was a major factor in the desire for security of tenure. Since, however, reduction in their primary sawmill capacity would result in reduction in tenure, one reason for retaining sawmill capacity, even though it is not as efficient as it might be, is to avoid tenure losses.

Thus, it would appear that the reduction in quota resulting from the Commission’s recommendations would come from that sector of the major industry most committed to higher valued production and would leave them further disadvantaged compared to their more secure integrated rivals. The justification for
quota given by the larger lumber firms are the benefits of log sorting as a prerequisite to adding value. It was pointed out that when the sorting was done internally by the firm, the costs associated with market transactions were avoided.

Remanufacturers Without Primary Breakdown Facilities

For established remanufacturers on the Coast, the disadvantages associated with the actual implementation of bid proposal sales tends to outweigh the associated advantages. This is because very few existing processors have received such sales. There is a general feeling that many successful bids had been too optimistic and were unlikely to come to successful fruition. In the meantime, they resulted in reductions in available timber for primary processors and also in available raw material for the secondary sector. In the lower mainland, where a high proportion of further manufacturing plants are located, access to raw material appears to be a minor consideration compared to other operational costs, especially when compared to rivals a few miles south across the border in the United States.

Although we did not meet with more remote small Coastal operators, we reviewed the research done in Region One concerning access to raw material. The problems expressed seemed similar to those we encountered in the Southern Interior. The raw material is available but there are additional costs associated with market size and market information as well as the cost of sorting for the specific materials required. One suggested solution in Region One is to use computer sourcing to match demand requirements with available supply.

There is not the same problem with the output profile of coastal primary producers as there is with the output of dimension mills in the Interior. This is one reason why coastal firms appear to have far fewer supply agreements or joint ventures with holders of 16.1 sales. The only one we encountered involved timber logged by an interior division of a major firm with the lumber exchanged coming from one of its coastal mills. However, there does seem to be a significant amount of custom remanufacturing on the Coast as well as the use of custom facilities such as dry kilns. Major firms are also finding other ways to cooperate with smaller value-added processors, ranging from log exchanges or sales to taking an equity position in the firm.

On the other hand, there does seem to be a timber access problem for small primary processors in Region One as well as a lumber access problem for further manufacturers. One suggested solution was to have Category 2 sales, as in the Interior.

Overall, there was no indication that a more competitive timber market would ease raw material availability problems for remanufacturers on the Coast by preferentially benefitting those most likely to supply them at an affordable price.

Remanufacturers with Primary Breakdown Facilities

The coastal firm we met which has both primary breakdown and remanufacturing facilities differed in several respects from its interior counterparts. The sawmill was not specifically designed to provide suitable material for the remanufacturing facility. In addition, the 16.1 sale held by the coastal firm represents a relatively small proportion of its total timber requirements, the remainder of which is purchased on the Vancouver log market. This firm has been competitive in accessing market logs and believes that a larger market would enable the entry of more such firms, especially if the larger Coastal capacity was reduced by relaxing the appurtenant mill requirements for major tenure holders. However, this particular firm is in a unique position as the single largest purchaser of logs on the Vancouver log market. There are other small coastal remanufacturers integrated into primary processing whose sawmills
are designed specifically around their value-added requirements. In these cases, there
do seem to be timber access problems, but it is difficult to determine the extent to
which a larger log market would be of assistance.

CONCLUSIONS

This study was designed to address three specific questions (page 2 of this
report) concerning the impacts on the structure and product mix of the solid wood
products industry in British Columbia of the “creation of competitive timber markets”.
Before attempting to answer these questions, some qualifications are necessary.

A perfectly competitive market is one in which neither the buyer nor seller can
influence the market price; each participant has perfect market knowledge and there
are no barriers to either entry or exit. The timber markets which would result from the
Forest Resource Commission’s recommendations fall far short of this ideal.

As described earlier, under the Commission’s proposals, current holders of long
term harvesting rights will be allowed to retain, in part, their exclusive access to Crown
timber. The impact of these recommendations differs by Coast and Interior. On the
Coast, a far greater proportion of the AAC is committed to Tree Farm Licences.
Furthermore, with one major exception, coastal Tree Farm Licence holders are
integrated sawnwood-pulp firms. In contrast, in the Interior, the most common form of
major tenure is the volume-based Forest Licence and existing Tree Farm Licences are
much smaller than on the Coast. Furthermore, there are several major interior lumber
producing firms which are not integrated into pulp and yet hold licensed cutting rights
to timber which provide them with a ratio of timber rights to processing capacity similar
to those for integrated firms. We estimate that, under the proposed changes in timber
allocation procedures, approximately 60 per cent of the coastal AAC would remain
under the exclusive control of major licensees while in the Interior this proportion
would be less than 40 per cent.
The Commission's report leaves moot the question of whether the competitive timber markets envisaged will be log markets or markets for standing timber. This question is clearly an important one which will not be addressed here except to note that, as pointed out earlier in this report, adding value to timber products starts in the forest. In this respect, stumpage markets would be preferred in that they would promote integration between harvesting and manufacturing.

**Hypothesis One**

*The creation of competitive timber markets is a key to reshaping the structure of the forest industry.*

The creation of timber markets, as proposed by the Forest Resources Commission, would have an impact on the structure of the forest industry. However, whether these changes would be compatible with public objectives for the Province's forest resources is questionable.

In the Interior, the AAC currently allocated to major tenures satisfies only about 75 per cent of their solid wood processing capacity, based on 2 shifts per day. Indeed the requirements of these major licensees actually exceed the total AAC available in the region. This has resulted in increasing competition among the large Interior mills for market supplies of timber from Category 1 small business sales, section 16.1 sales (through exchange agreements i.e., lumber for logs) and also on timber from the limited area of unmanaged private forest land held, mainly, by small owners. Given the situation of overcapacity, a transition to a different industry structure is inevitable. The question is whether the Commission's recommendations would be the best way of managing the transition.

Stripped of a substantial proportion of their captive timber supplies, major companies with large scale saw mills, or integrated operations, would compete vigorously for market supplies. In order to compete successfully in the market place, large, capital intensive, Interior sawmills have a high minimum operating level. Operating rates below this level can not be sustained for very long before a mill is forced to shut down. Survival, therefore, will depend on being successful in the market place and prices will be bid up. Firms with pulp capacity will be at an advantage in that they are able to capture the full economic value of sawmill residues. There will be market casualties and some mills will be closed down reducing industrial capacity.

Independent, specialty sawmills who hold Forest Licences would lose a substantial proportion of their secure timber supplies and would have difficulties competing in the market place for the shortfall. Small sawmills, which currently depend on category 2 sales, would be disadvantaged by their lack of secure timber supplies and capital reserves available to the major companies. They cannot compete against the modern, high-tech mills of the majors in the production of dimension lumber. Their advantage lies in greater flexibility which allows them to produce a variety of products for local use and for remanufacture. However, the values available to them in these markets, their small scale, the fact that many of them do not have the facilities to produce pulp chips, and their lack of access to capital for upgrading, suggest that they would not be able to outbid their larger competitors for limited timber supplies and that many would be forced to close down.

Lumber remanufacturers and secondary manufacturers, particularly in the southern Interior, would suffer some reductions in their raw material supplies if small sawmilling capacity was reduced. Non-integrated remanufacturers and secondary processors with section 16.1 timber sales might be better off, in that their ability to negotiate exchange agreements with major sawmills might be strengthened. However,
those with no access to standing timber would find it no easier to access their raw material supplies.

The net result would probably be a more concentrated primary processing sector and a relatively smaller independent further manufacturing sector. The competitive structure would be more economically efficient in that returns to the resource, in the form of economic rents, would be maximized and these returns would be captured by the Crown. However, the transition would be painful in terms of industrial dislocation and other social goals for the resource, including employment and community stability, would not be well served. In the Interior, the market solution would result in an uncontrolled transition rather than a managed transition to a reshaped structure.

The situation on the Coast, as already pointed out, is very different to the Interior. The timber resource provides greater potential for the manufacture of higher value end products and the industry is already exploiting the opportunities to a much greater degree. Under the Forest Resources Commission's proposals, the large integrated firms on the Coast would retain a much higher proportion of their captive Crown timber supplies than their Interior counterparts. Since it is not known how much these firms rely on their captive tenure for raw material for pulp mills, it is uncertain what sawlog requirements they would be seeking in a competitive timber market. There does not seem to be the same differences in economic efficiency related to scale as in the Interior and mills are more flexible in terms of their product and volume requirements. Thus, while competition for increased market supplies would be intense, smaller mills cutting a variety of grades and sizes would be able to compete and this segment of the industry would probably grow proportionately. Further, if Tree Farm Licence holders were released from the requirement that they maintain sawmilling capacity (a recommendation not made by the Commission) some integrated firms might reduce the sawmilling side of their business and there would be a rationalization of primary breakdown capacity. Some mills would be closed down, with associated community disruptions, others sold and a higher proportion of logs would be placed on the market.

A higher volume of timber entering competitive markets would have no direct impact on independent remanufacturers and secondary processors. As will be seen below, the future of this segment of the industry depends on a number of other factors.

In summary, more competitive coastal timber markets are a necessary, but probably not sufficient, condition to help drive the sawmilling industry towards rationalization resulting in greater efficiency and the generation of higher economic rents. In contrast to the Interior, concentration of control over primary breakdown capacity might be reduced and the proportion of small to medium sized independent mills increased. The changes would have little impact on the independent remanufacturing and secondary processing sectors.

**Hypothesis Two**

A major barrier to the establishment of smaller scale, regionally owned and operated manufacturing plants is timber availability.

This question will be addressed in two parts. First, with respect to small scale primary sawmills and, second, with respect to independent remanufacturing and secondary wood processing plants.

In the Interior, although small independent category 2 sawmillers might claim that timber availability is a constraint on the growth and prosperity of the sector, their concern is that too much of the allowable cut is committed to major operators (which they might define as anyone larger than themselves). Their solution to this problem is
twofold. First, they would like to see more of the SBFEP AAC allocated to Category 2 sales, second, they would like to have a degree of timber supply security comparable to that of the major tenure holders. This latter measure would help to solve one of their most pressing problems - access to capital. The "problem" they face, therefore, is not so much one of timber availability but a more secure, greater supply of timber available at the right price. As indicated above, these smaller firms could not compete with the owners of large scale, high tech., dimension lumber mills in a competitive timber market. In the type of market which would result from the Forest Resources Commission's recommendations it is their belief that they would be decimated and we agree with them.

Interior specialty sawmills, smaller than the dimension mills but larger than Category 2 plants, would be in a similar position. Some of these are eligible for section 16.1 sales and see the provision of more timber in this type of protected category as important for their survival.

Independent, non-integrated sawmills on the Coast largely rely on the Vancouver Log Market for raw material supplies. They compete here for available supplies and would be the major beneficiaries of increased market supplies, provided there was continued protection from the global log market. On the Coast, it would be correct to say that this sector is constrained by timber availability and that a higher volume log market would improve access to the industry and help the most efficient firms to grow and prosper.

Turning now to the independent remanufacturers and secondary processors whose raw material requirements are lumber, not logs or standing timber. Again, the question is not a simple one of raw material availability but, rather, availability at a price manufacturers can afford. The ultimate value that can be added to the resource is determined by the market place. The ability of producers to add value depends on their ability to do it at an incremental cost which is no greater than the additional value realized. The amount they can afford to pay for raw material is equal to the revenue that the volume in question would realize in the market place less all the costs, including an adequate profit margin, of processing and marketing it. Lumber is available for remanufacture both in the Interior and on the Coast provided the buyers are willing to pay the market price, which includes a premium for making the material available in the form (species, grades, sizes and quantities) desired. In the Interior, as we have seen, these premiums can be considerable and place the price of the material beyond the further manufacturers' ability to pay. On the Coast, this problem is less acute, but, as in the Interior, further manufacturers face many other problems which reduce their ability to compete as buyers in lumber markets.

British Columbia producers of further manufactured products are at a cost disadvantage arising from their location. For the generic items sold in North America, distance from markets presents problems in terms of transportation costs and consumer service. For custom goods in Japan and Europe, distance translates into a type of transaction cost arising from the need to understand market requirements in terms of products and service and the development of market niches and consumer confidence. Secondary manufacturers and many remanufacturers do not sell their products, in the sense that commodity lumber is sold into competitive markets, rather they have to market them in ways which add considerably to their costs.

Independent, further manufacturers also face problems of access to capital. Small businesses face such problems in all sectors, however, in the production of further manufactured wood products these are exacerbated by chronic uncertainty in the raw material markets they rely on. Without some security of raw material supply, the necessary capital for the establishment, or expansion, of a manufacturing plant is
difficult to obtain (this is one reason why the intent of the Section 16.1 sales is generally supported by the further manufacturing industry).

Generally speaking, the more highly manufactured a wood product, the greater the importance of labour in its total production cost. British Columbia producers face higher labour costs than their American counterparts which explains, together with lower land costs, capital costs, and taxes in the United States, why so many firms in the industry have relocated, or are contemplating relocating, south of the border.

In summary, timber availability is an oversimplification of the many factors affecting the establishment and growth potential of smaller scale, regionally owned and operated wood manufacturing plants in British Columbia. With the possible exception of independent primary processors on the Coast, it is doubtful that more competitive timber (log or stumpage) markets would help this sector of the industry.

Hypothesis Three

Relatively low, administratively determined stumpage prices have an impact on the industry’s product mix pushing it towards lower value commodity products.

As explained above, the major force driving a firm towards a certain product mix is the desire to maximize profits, or the difference between sales revenue and total production cost.

Many factors enter this decision. If a firm does not have to compete for timber, then the stumpage price, administratively determined, is one element of raw material cost and, as such, will help determine the firm’s most profitable strategies in terms of product mix and choice of processing technology. There is no reason to believe, however, that if stumpage price is “relatively low” a firm will necessarily choose to manufacture low value products. What economic theory does imply is that a firm may be less frugal in its utilization of the resource. This would be reflected in the choice of technology and relative intensities of use of the various factor inputs. In B.C., for example, labour, is a relatively expensive input, it is still used to make commodity products but labour productivity rates are very high.

A firm’s choice of output thus will depend on product values and all the costs associated with manufacturing and delivering them to the market. During the 1960s and 70s, for example, growth in the production of commodity dimension lumber in the Interior was largely the result of market opportunities presented by growing United States’ import demand for such products, not by low stumpage prices. Economies of scale in production became feasible with growing demand and changing technology and firms were encouraged to pursue such economies by rising labour costs and a tenure system which guaranteed adequate wood supplies, thereby reducing uncertainty and improving access to capital markets.

If a firm must compete in a market place for timber, then its survival will depend on its ability to outbid its competitors. The amount it can bid is the residual found by subtracting all production costs, other than the cost of purchasing timber, from sales revenue. In such a market situation, each firm has a strong incentive to choose that product mix which maximizes its ability to compete for raw material. However, there is no reason why high value, further manufactured products will be chosen. For example, on the Coast, in the absence of restrictions on log exports, a firm might well find that the production of logs for export is its optimum competitive strategy.

In summary, competitive markets encourage economic efficiency and ensure that resource rents, captured by timber owners in the form of stumpage, are maximized. However, there is no reason to believe that maximizing returns to the
resource will result in a "higher percentage of further manufactured products in the product mix". Adding value also means adding costs and will only be pursued if such a strategy improves net returns and, thus, enhances a firm's ability to compete in the market place.

The production of higher value wood products is traditionally associated with more labour intensive processes which provide more jobs per cubic metre of raw material processed. Increasing employment within the forest products sector may be a perfectly legitimate public goal. However, increased economic efficiency and increased employment opportunities are not complementary objectives, especially in a high wage, high standard of living economy like B.C. The trade-offs involved must be explicitly recognized in public forest policy.

The product mix of the wood products industry is primarily driven by markets. In British Columbia, the further manufacturing industry is disadvantaged by location and high labour costs. Competitive markets for logs or stumpage would result in timber being allocated to those who enjoy a comparative advantages in product market access and manufacturing costs.

Since the last century, the primary processing industry in British Columbia has been protected through log export restrictions. This explicit industrial strategy has, undoubtedly, increased the size of the industry and the number of people employed and is still widely supported today. However, further growth in primary processing is limited by raw material supplies and the industry will probably shrink in size in the future as increasing demands are placed on the resource base. The importance of the industry as a source of jobs and community stability might be preserved by further processing solid wood products, however, explicit strategies designed to achieve this goal may be required. The policy initiatives proposed by the Forest Resources Commission will not serve this end and, indeed, may be counterproductive.

**RECOMMENDATIONS**

- In so far as questions surrounding timber supplies, their allocation to various industrial users and the structure of the forest industry are inexorably linked and affect the many benefits derived from the resource by the people of British Columbia, they should be dealt with in a coordinated manner in order to develop a comprehensive industrial strategy for the Province's forest products sector.

- In developing such an industrial strategy, it must be explicitly recognized that public goals for the forest industry: economic efficiency; higher value added; and increased employment opportunities, are not complementary. The trade-offs between these conflicting objectives must be understood and methods developed for evaluating them and achieving an acceptable balance between them.

- The timber supply and allocation requirements of the industrial strategy must be coordinated with an overall land use strategy for the Province's forests in order to facilitate the design of optimum tenures for comprehensive resource management purposes.
APPENDIX ONE


British Columbia Minister of State for Vancouver Island/Coast. 1988. *Adding Value to B.C. Solid Wood Products. Region One Forestry Task Force Symposium.* Informal Services, Nanaimo, B.C.


Council of Forest Industries of British Columbia (COFI). (Various years). *British Columbia Forest Industry Statistical Tables.* Vancouver, B.C.


Independent Lumber Remanufacturers' Association. (Various years). Membership Directory. Langley, B.C.


APPENDIX TWO

List of Interviewees and the Firms and/or Organizations They Represent

A. Interior

Holders of major long term tenures:

- Mr. Bob Lebeck, Sales Manager, Quesnel Laminators, Division of West Fraser Mills Ltd., Quesnel.
- Mr. Ross Gorman, Gorman Brothers Ltd., Westbank.
- Mr. Gordon Steele, Riverside Forest Products, Lumby.

Holders of Section 16.1 sales with primary breakdown and/or further manufacturing facilities:

- Mr. Pieter Byl, President, Scana Industries and Woodland Windows, Prince George.
- Mr. John Byl, Scana Industries and Woodland Windows, Prince George.
- Mr. Bill McInnes, President, Prince George Pecut Ltd., Prince George.
- Mr. Arnold Zwiers, President, Canadian Woodworks, Prince George.
- Mr. Joe Cerasa, President, C and C Wood Products, Quesnel.
- Mr. Dennis F. Powell, Abeda Wood Products, Winfield, President, Interior Value Added Wood Association.
- Mr. Gary Hill, General Manager, Milestone Wood Products Inc., Armstrong.
- Mr. Robert G. Bird, Plant Manager, Canwood Furniture Factory Inc., Penticton.

Remanufacturing facilities with no Crown timber allocations:

- Mr. Rae Fujikawa, Managing Director, Okanagan Lumber Services Ltd., Enderby.

B. Coast

Holders of long term major tenures:

- Mr. J. D. (Des) Getz, Group Vice President, Coast Wood Products, Fletcher Challenge Canada, Vancouver.
- Mr. J. A. (Jim) Shields, General Manager (Marketing), Coast Wood Products, Fletcher Challenge Canada, Vancouver.
- Mr. J. D. (Jim) Chisholm, Manager, North American Industrial Sales, Lumber Marketing, MacMillan Bloedel Ltd., Vancouver.
- Mr. David Kyle, Manager, Lumber Marketing and Product Development, Weldwood of Canada Ltd., Vancouver.
- Mr. Bob Sitter, President, International Forest Products Ltd., Vancouver.
- Mr. Fred Lowenberger, Vice President, Forest and Land Use, International Forest Products Ltd., Vancouver.

Holders of Section 16.1 sales with primary breakdown and/or further manufacturing facilities:

- Mr. George L. Malpass, President, Primex Forest Products Ltd., Delta.
- Mr. Shaun Sullivan, Vice President, Corporate Development, Primex Forest Products Ltd., Delta.
Mr. B. H. Blondal, President, Tyee Timber Products Ltd., Langley.

Mr. Trevor Buddo, Tyee Timber Ltd., Langley.

Remanufacturing facilities with no Crown timber allocations:


Mr. James A. Gillis, President, Haida Forest Products Ltd., Burnaby. (associated with primary Mill and Timber, a primary breakdown firm with small tenure)

Mr. Sawarne Sangara, Sawarne Lumber Co. Ltd., Richmond.

Others:

Mr. K. J. (Ken) McClelland, Manager, B.C. Wood Specialties Group, Vancouver.

Mr. W. G. Bill Howard, Manager, Small Business Program, Timber Harvesting Branch, B.C. Ministry of Forests, Victoria.