The Status and Direction of the Lumber Remanufacturing Sector
in British Columbia - FRDA Report 045

INTRODUCTION

The continued decline in real prices for commodity grades of lumber has focused attention on the need to produce other grades and products. These products can either be developed directly at the log conversion stage (primary manufacturing) or at a number of subsequent processing activities.

The remanufacturing sector of BC is currently a hot topic receiving a great deal of attention from industry, governments and labour alike. It offers the potential for increased profit, expanded industrial activity and additional jobs.

Some isolated facts or estimates are:

- In 1986, the B.C. Independent Lumber Remanufacturers Association (BCILRA) represented 33 members and associates employing 900 people, processing 315 million board feet per year.

- The BCILRA had 53 member companies in 1987 and is estimated to account for around 60% of the sector activity in BC. These members produce around $750 million/year of sales which would indicate a total of $1.2-1.4 billion sales per year for the BC remanufacturing sector.

- The 1984 Woodbridge, Reed report “Secondary manufactured solid wood products in BC” identified about 65 firms engaged in remanufacturing in BC, employing 1,800 people and consuming well over 500 million fbm per year.

- A recent press release from the BC government’s Department of Economic Development identified a total of 135 independent “specialty product” manufacturers producing in the order of 1,460 million fbm per year at the end of 1987.

- Shipments from Northern Interior Lumber Section members in millions of board feet, based on 1987 financial statements:

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<th>1987 Actual</th>
<th>1988 Budget</th>
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<tr>
<td>Primary lumber</td>
<td>4,836</td>
<td>4,600</td>
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<tr>
<td>Remanufactured goods</td>
<td>61</td>
<td>90</td>
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<tr>
<td>Percentage of Reman to Primary</td>
<td>1.3</td>
<td>1.96</td>
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Note, however, that many of the remanufacturers in the Northern Interior are not members of NILS.

There does, however, appear to be an indication that the sector is growing.

RELATIVE SCALE, REMANUFACTURING COMPARED TO PRIMARY LUMBER SECTOR IN BC

In order to obtain some indication of the relative importance of the sector, the following figures are presented. Though it is known that the figures are far from precise, they at least provide an order of magnitude indication of the significance of the sector. Depending on which criterion is used, it would appear that the sector is around 5-15% of the sawmilling sector. It is probable that this percentage is currently somewhat higher.

Annual lumber throughput
- BC primary lumber sector 15.9 billion fbm/yr (1987)
- BC remanufacturing sector 1.46 billion fbm/yr (1987)
- Percentage = 9.1

Employment
- BC primary lumber sector 29,001 employees, total activity (1985)
- BC remanufacturing sector 1,666 employees (1985)
- Percentage = 5.7

Value of goods shipped
- BC primary lumber sector $4.032 billion/yr (1985)
- BC remanufacturing sector $0.66 billion/yr (1985)
- Percentage = 16.0

Source: Statistics Canada 35-250B SIC 2512, BCILRA estimates
STATE OF TECHNOLOGICAL EVOLUTION OF THE REMAN SECTOR

Examples exist in BC of the extremes of sophistication in technologies.

Sophisticated scanning and mill-wide computer decision making equipment, largely handed down and adapted from the medical and aero-space sector is now employed in the primary sector, but has yet to make significant inroads into North American remanufacturing. Indeed, it is not yet certain what degree of sophistication in terms of computerization, scanning, robotics, automation CAD/CAM/CIM, etc. is appropriate, either for the individual company or for the province.

A major problem faced by many in the remanufacturing sector in BC has been the lack of capital available to invest in the latest technologies. Instead, the companies have often relied on a great deal of ingenuity plus used equipment.

In Europe, several thousands of years of experience of furniture and cabinet making using skilled crafts people organized into guilds with father-to-son training has evolved into a hybrid of hand, machine and computerized machine manufacture.

Lod by West Germany, Sweden, the UK and Italy, a precision wood working machinery sector has built up, evolving from quality hand tools, through precision manually guided machinery, into scanning and computer-assisted optimizing machines. In addition to satisfying domestic and export demand for quality finished wood products, Europe has built up a leadership in advanced woodworking tool design, manufacture and export industry. In addition, the Europeans have pioneered many of the advanced remanufactured wood products.

THE MARKET NICHEs FOR THE REMANUFACTURING SECTOR

Significantly more than half of the traditionally remanufactured wood products are most suited for dense hardwoods — that is oak, maple, birch, - which are in limited supply in BC and, in consequence, have not formed part of BC’s traditional products. The comparative softness of BC’s softwoods leads to poor wear and surface indentation resistance and hence severely limited application. Resistance to rot, to, is a limiting factor to the use of BC’s softwood, though western redcedar and yellow cedar (cypress), along with kiln drying and chemical preservation produce durable products.

Cedar traditionally accounts for over 50% of the species remanufactured in BC. Cedar is important since the Pacific Northwest contains the last significant natural cedar forests and cedar has unique properties for external use, is low in density and has an attractive colour and grain. The cedar shake and shingle sector is considered to be a specialty product and as such falls into the Gray area between primary and secondary product categories, generally falling into the latter.

A key concept of all lumber processing that takes place after the primary breakdown is that the person downstream, including the final product user, is willing to pay more for a more refined product.

BC is ideally positioned at the radius of curvature focus of the industrializing Western Pacific Rim countries, who will soon develop increasing standards of living and be able to upgrade their domestic shelter and standard of comfort.

A major trend is to provide export specialty products for the Japanese and European (West Germany and the UK in particular) domestic shelter components markets. Products such as taruki (rafters) and laminating stock for window and door manufacture are in significant demand at attractive prices. Unlike commodity dimension lumber, these products are required in a very wide, but precisely defined, range of specifications such as specie, grade, grain-orientation, moisture content, cross section and length. Components are detailed in engineering drawings complete with dimensioning and tolerances — previously more usual in metal component manufacture.

New technologies such as wood densification, environmentally safe treatments for preservation and lowered fire resistance, and hybridization with plastics, metals will enhance the physical properties and durability of BC’s remanufactured wood products.

The essence and attractiveness of remanufacturing lays in its ability to upgrade lumber by eliminating defects while at the same time generating the shape and product size desired. The primary lumber sector in BC focusses on producing and selling large volumes in long lengths (typically 8-24 feet) and wide widths (10 and 12 inches) of uniform lumber. In reality, the remanufacturer can identify small volume markets requiring short lengths (less than 8 feet) and narrow and unusual size combinations. By carefully ripping (sawing lengthwise), and cross cutting to avoid areas containing knots or rot, a variety of smaller, higher unit valued items can be obtained from otherwise defective, low valued lumber. In addition, edge and face gluing and finger jointing all permit smaller pieces to be reconstituted into larger, more stable pieces.

The primary sawmill focusses on volume throughout and is ill-equipped to provide the many cross sections, grades, and patterns to satisfy a variety of window or door customers. The logical intermediary between sawmill and the window assembly plant is the remanufacturer.

REAL THREAT FOR WOOD’S TRADITIONAL MARKETS

The real threat in maintaining North America’s primary and secondary wood markets comes not from competition by one wood manufacturer with another, but from substitution by other materials — such as plastic or metals. These substitutions cause a permanent reduction in the wood manufacturing sector. A major advantage of these products lies in the supplier’s ability to provide precisely the component required to close manufacturing tolerance as opposed to a large piece of wood that must be reworked. Remanufacturing can offset this advantage. In addition, remanufacturing can help modify wood — by custom treating or finishing it in an appropriate manner — to ward off competition by substitution resulting from user dissatisfaction with wood. Wood’s best defense against substitution is by highlighting its many positive attributes and minimizing its few negative attributes. Remanufacturing permits this enhancing to occur.
Examples where substitution has made successful inroads include:

- railroad ties and utility pole in concrete;
- pipes and flumes, minepit props, fences, gates, pallets and garage doors in steel;
- house siding and soffits in vinyl or aluminum;
- mouldings, sports gear, toys, brush and axe handles and plastic containers;
- agricultural and small parts containers in plastic or corrugated paper;
- moulded plastic cabinet doors;
- metal entry doors; and
- vinyl and aluminum windows.

THE PROBLEMS FACING THE REMANUFACTURING SECTOR

Raw Material

In contrast to the primary sector which generally has a secure long term supply of logs, the secondary manufacturer must rely on the purchase of lumber. Only rarely are these purchases made on anything but relatively short term contracts.

Some BC remanufacturers have found it necessary to have better control of their primary materials — by quality, price and deliveries — and have "back integrated" by acquiring a primary sawmill and even taking the double-step of acquiring standing timber and logging facilities to ensure total control.

A common dilemma of remanufacturers is that they have, until recently, been a relatively minor customer of the sawmill. The focus of the established primary industry has been on high volume throughput and reduced costs. Where the logs can yield high grade lumber the sizes cut are those suited for export markets.

Since the BC reman sector is small in comparison with the export market, few large scale sawmills in BC are interested in cutting those specifications which could be used efficiently by the remanufacturing sector. In consequence, the reman sector tends to either:

- Inefficiently convert CLS and export sizes;
- Utilize shorts, mismanufactured products, splits, and jags;
- Purchase custom-sized product from small sawmills; or
- Backwards-integrate by acquiring its own sawmill and timber supplies.

The large variability in lumber sizes coming from small mills is frequently cited as a reason to backwards integrate. Planters, for example, cannot accommodate large variations in sizes between boards. By owning the small mill, supplies of acceptable materials can be assured.

The term "lumber remanufacturing" tends to imply that the initial (primary) manufacturer did something wrong and hence the (secondary) remanufacturer has the task of correcting that mistake. In some senses, this is a correct connotation in that more value was left in the wood by the primary producer than he should have left — hence leaving sufficient value for the remanufacturing sector to exist.

The astute remanufacturer identifies his market niche and matches the tertiary users requirement with the most efficient primary product sourcing. He then installs the most efficient conversion and physical distribution system to satisfy the tertiary user.

Investment

With a few exceptions, the remanufacturing sector lacks credibility with the investment community. There are some sound fundamental reasons. One is the lack of security of raw material supply. Another is the track record of the sector with numerous examples of failures — often due to underfinancing which in turn leads to lack of working capital, poor equipment and inadequate marketing. A more general problem is the difficulty faced by the potential investor or lender in undertaking any objective analysis of the enterprise.

External investors to any business sector expect to be able to obtain time series data on the remanufacturing industry's production and financial performance and listings of key companies, products, who's-who, much like the primary lumber. Also, information from trade associations, magazines, text books, equipment manufacturers brochures would support such investment, as would forest mensuration and product/market profiles. Surprising little data exists on a sector with such potential.

Offshore investors must wonder why in a province blessed with raw materials, energy and human resources, the remanufacturing sector is so poorly defined and so lacking in objective decision making data. Each investor is expected to accept 3-year-old data as current and to have to recreate even basic time series of fundamental data.

Anomalies abound that defy logical explanation:

- a new Surrey window (tertiary) assembly plant that was unable to obtain supplies of high quality wood components from BC and is obtaining them from Sweden;
- Prince George area remanufacturers able to sell knock down components to furniture stores in Sweden; and
- examples of obsolete and labor intensive facilities surviving in BC while new facilities with high labour efficiency fall or move to Southern Alberta. A visitor to BC can be shown examples of the worst remanufacturing plants alongside those with elements of the best.
Taxation

Sweden is often identified as the leader that BC should follow in the whole area of value added. The emphasis on the remanufacturing in that country is very significant. According to some statistics seen for 1985, 44% of all investment in the solid wood sector was devoted to remanufacturing. This figure was dramatically higher than the level for 1980, which was already an impressive 28%. No similar information is available for BC but it is highly unlikely to have been as much as 10%. One major reason has been the tax approach.

The Capital Cost Allowance (depreciation write-offs) favour continual upgrading of plants in Sweden compared with BC. At the same time, the person income taxes on both investors/entrepreneurs and wood owning farmers in Sweden discourages them from investing or selling their wood. In consequence, the cost of delivered wood to the primary, and hence secondary sector in Sweden is far higher than in BC. High wood costs have encouraged exceptional effort to extract value in Swedish primary and secondary facilities.

Expansion Opportunities

There is no realistic constraint imposed by the market place on expansion of the remanufacturing sector. Clearly not all the lumber processed in BC can be subjected to remanufacture into, for example, window stock. However, there are many market niches to be found and developed. Furthermore, a substantial amount of the fibre will still be profitable converted to commodity lumber. The expansion of the sector to the point where there is oversupply is unlikely in the medium term, provided that a diversified approach is taken.

Research, Development and Training

The B.C. Ministry of Forests has initiated discussion with a broad spectrum of those involved in remanufacturing. The purpose has been to identify the common needs of the sector and how these may be addressed.

These initiatives will provide the necessary impetus to move the remanufacturing sector to a more prominent position in the forest industry.

Future Directions

The widespread application of available advanced technology and the introduction of evolving technology will transform the remanufacturing sector in a similar manner to that caused by scanning and computer optimization in the majority of BC’s sawmills. The rate of change attributable to technology has accelerated with time. Globally, the reman sector took thousands of years to progress from hand tools to machine tools.

Just as today’s car plant bears little relationship to its predecessor of ten years ago, we can expect dramatic change in remanufacturing in the next ten years.

Other advances will be in such areas as:

- plant scheduling, order file optimization;
- MSR capable of operating to any international grading rules and optimizing breakdown for value;
- laminating;
- plastic coated moulding;
- elimination of saw kerf and sawdust by application of laser and abrasive water jet cutting;
- in-line microwave drying;
- laser incising and in-line staining, painting or environmentally safe treatments and preservatives;
- extensive use of bar-code (Universal Product Coding - U.P.C.) of components for routing, inventory and for tertiary users;
- automated machine adjustment to monitor and maintain tolerances and to reset for new products. This will also involve machine tool changes as tools become dulled;
- hybrid products involving wood, metal and plastics assembled within the reman plant; and
- densification of the wood using softening chemicals and forging presses — examples include “Renova” and “Wstilwood”.

Copies of the 27 page report The Status and Direction of the Lumber Remanufacturing Sector in British Columbia are available, while supplies last, from:

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