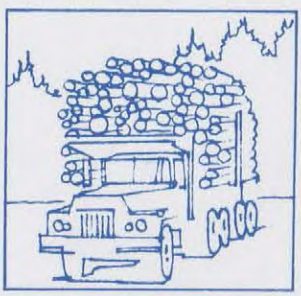
Canada

Review of the Canadian Manufactured Housing Industry



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Regional Industrial Expansion
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REVIEW OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY

Converted Wood and Paper Products Division

Forest Products Directorate

Resource Processing Industries Branch

Department of Regional Industrial Expansion

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FOREWORD

I am pleased to be able to provide this review of the manufactured housing sector to members of the industry. It is one of several reports which have been prepared on major sectors within the converted wood and paper products industry in Canada. The others include kitchen cabinets, wood windows and doors, converted papers, and the paperboard packaging industry. These reports were prepared by the Converted Wood and Paper Products and the Pulp and Paper Divisions of the Department of Regional Industrial Expansion (DRIE).

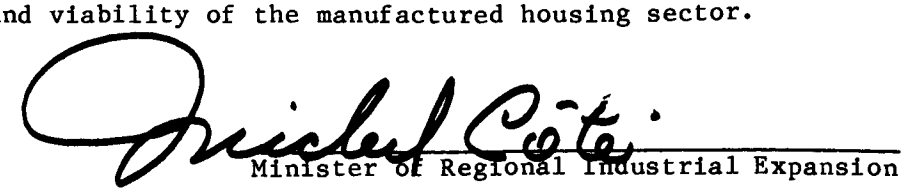
The Subcommittee on Converted Wood and Paper Products, under the aegis of the Forest Sector Advisory Council (FSAC), has reviewed and advised on the reports. The FSAC, comprising executives of forest industry companies and labour unions along with some university representation, was established to provide the Minister of State for Forestry and myself with advice on the full range of resource, industrial and trade issues affecting Canada's forest industry.

These reviews are, I believe, the most comprehensive descriptions and analyses of the sectors published to date. In addition to providing a detailed examination of the characteristics of each sector, the reviews also identify a number of key issues currently affecting their well-being as well as a number which are looming on the horizon. As wood fibre resources become increasingly scarce on both the domestic and international fronts and unemployment continues as a major concern, the potential contribution of these value-added sectors to regional development and employment will become more significant.

The primary intent of the reviews is to encourage companies and industry associations to focus on the pertinent issues, be they company specific or industry wide. It is my hope that the reviews will stimulate companies to assess their performance and future opportunities and focus their attention on continuing improvement to productivity and marketing. The key objective, one that has been emphasized by the advisory Subcommittee, is the improvement in international cost competitiveness which is required not only to maintain domestic market share, but also to expand exports. The competitive position of the Canadian industry will be particularly important if further trade liberalization takes place.

The department would be pleased to hear the views of the industries and associations concerned. I believe it is essential that we have strong communication links between management, labour and government to address industrial issues whether they be productivity improvement, adjustment to changing economic forces, export market development or questions of trade access.

In summary, I welcome an open dialogue on all matters affecting the future performance and viability of the manufactured housing sector.



Minister of Regional Industrial Expansion

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INDUSTRY OVERVIEW

The major source of data for this report on the Canadian manufactured housing industry is Statistics Canada Report 35205, Section II, Manufacturers of Prefabricated Buildings (SIC 2543). These data have been supplemented, where necessary, by information gathered through company interviews, divisional files, the author's knowledge of the industry, periodic consultations with major industry representatives, Dun and Bradstreet Reporting System data and from provincial government reports.

The manufactured housing industry, as classified by Statistics Canada, includes establishments whose principal activity is the manufacture of pre-engineered or pre-cut buildings of wood or wood-frame construction. By this definition, pre-engineered wooden buildings include all buildings that are manufactured at a plant, either in sections or in components, for on-site assembly.

While Statistics Canada is the principal and official source of industrial statistics, and these are referred to throughout this report, it should be recognized that there are inherent limitations to this information base on manufactured housing. The latest complete figures are for 1982, and the industry has continued to change since that time. Some of the smaller operations which manufacture other products as well are likely included in other statistical categories. The products included in this report are somewhat different than those included in SIC 2543. For example, the mobile home sector is included as part of SIC 3244 and is without published principal statistics. As with many other small industrial sectors in Canada, the manufactured housing sector does not have a complete statistical base available for analysis.

For the department's definition purposes, the industry comprises manufacturers of six different types of building products. These are cut-to-size packages, open-panel or component houses, log houses, modular houses, mobile homes and industrial camp units. A further explanation of these products is contained below. The companies in this sector normally produce one of the six product types referred to; however, in some cases companies produce a variety of the products in different plants.

For purposes of analysis, companies can be divided into three categories based on the number of employees engaged and the number of units produced on an annual basis. The first category includes companies employing over 150 workers and producing more than 600 units. There are five companies in this category. The second includes firms with between 100 and 150 employees which produce between 300 and 600 units annually. There are 13 companies in this category. Those in the third group, which includes the majority of companies listed, have far fewer than 100 employees per company and produce fewer than 300 units per year. In 1984, there were approximately 80 firms operating in this third category.

The industry has undergone a good deal of change during the past six years due to economic downturn factors and a shrinkage in demand in local and export markets for some products in this sector. Due to such turbulent factors, a large number of companies have ceased production and few new firms have been established in recent years.

Consequently, owing to the rapidly changing economic environment, available data provide a somewhat less accurate picture of the industry for the present period than might otherwise have been hoped.

Description of Range of Products

A **manufactured house** may be defined as a dwelling unit in which at least half of the structural frame has been produced in a factory remote from the job site. The amount of plant assembly may vary from the production of cut-to-size pieces through subassemblies of wall panels and trusses to completed three-dimensional or modular units. This report is confined to operations using wood for the structural frame.

The types of manufactured houses may be defined as follows:

1. **Cut-to-size packages** - All the framing members of a house are shaped and identified according to the structural plan and shipped as a package to the job site for assembly by on-site labour.

2. **Manufactured log houses** are all of the cut-to-size package type and include wall and roof structures shaped from natural logs or sawn solid timbers cut to patterns for interlocking on site.

3. **Open panel or component houses** - External walls are assembled into sections (panels) and shipped to the job site for erection. The panels are open in that exterior sheathing is applied in the factory but in-wall insulation, services and interior sheathing are installed after assembly on the job site.

   When a whole-house package of open panels is shipped, other subassemblies are included such as roof trusses, cut-to-size joists, windows, pre-hung doors, stairs and cabinets, as well as bulk quantities of gypsum wall board, shingles, finish flooring, exterior siding, insulation, vapour barrier, nails, hardware. An open panel house may include some or all finishing materials according to the purchase contract.

   This is the most widespread and common product of the sector.

4. **Modular houses** - These houses consist of completed three-dimensional transportable units. Often two or more are joined together on the job site to form larger housing units or multiple dwellings such as town houses, low-rise apartments or motels.

   (a) Ready-to-move houses are large, single-unit modular houses designed to be transported locally. They are rare outside Saskatchewan.

5. **Mobile homes** are similar to modular houses except that they are built on a steel chassis and are designed to be transported on their own integrated running gear. In Canada it is rare to connect more than two units which are known as "double wides". Mobile offices and mobile recreational homes also form part of this subsector.

6. **Industrial camp units** are similar to mobile homes except that many do not have running gear and are usually finished for multiple assembly into dormitories, dining halls, schools or hospitals. They are used for relatively temporary accommodation on remote construction sites in support of resource or construction developments. They are usually built for specific uses and environments such as geophysical camps and oil production projects in Arctic or desert locations around the world.

All the above products use similar available materials and standard assembly techniques. They differ in the degree of completion, size and kind of finish or decoration used. A cut-to-size operation may be a simple woodworking plant, while an industrial camp factory may be a complex operation involving professional design and management personnel and large inventories of specialized materials and equipment.

In general, the success of all these types of manufactured housing depends as much on good marketing and financial management as on efficient production. Each product has a fairly distinct market, and house manufacturers compete more with site-built housing than with each other. Local manufacturers, by nature, are small and dispersed and do not lend themselves to direct competition from more than one manufacturer. In recent years, component manufacturers have been supplying increasing quantities of subassemblies to site builders to the mutual benefit of both groups. This trend is most common in the southern U.S. and may become more prevalent in Canada.

Most house manufacturers produce only one type of product (as discussed above) and operate one plant. A few large operators produce more than one kind, such as mobile homes and industrial camp or mobile office units, but may use separate plants in different regions, usually located near the market. The ease and economy of transporting the finished unit are major determinants in locating plants as these costs affect the final selling price of a unit. Component and log houses and industrial camps can be designed for overseas delivery.

Basic Industry Characteristics

Statistical Summary

In 1982, establishments included in SIC 2543 (wood-frame prefabricated buildings) and some in SIC 3242 (mobile homes) shipped $318 million worth of product and employed approximately 4 500 people. Exports for wood-frame buildings alone were $52 million. As indicated in Table I, the industry showed a significant drop from 1981 when shipments were valued at $474 million; employment was estimated at 6 000 jobs and exports totalled $134 million. This decline was due to a reduction in both domestic housing starts and export opportunities. Industry rationalization has continued since 1982, and some stability was achieved in 1984. The overall decline in production and employment has been especially serious in the mobile home subsector.

TABLE I

Principal Statistics on Manufactured Housing, 1982 and 1981

	1982	1981	% Change 1981/1982
Manufacturers of Wood-Frame Prefabricated Buildings (SIC 2543)			
Number of Establishments	99	103	- 4.0
Value of Shipments of Own Manufacture ($000)*	215 339	374 117	- 31.4
Value Added ($000)			
- Manufacturing Activity	74 413	163 164	- 54.4
- Total Activity	93 155	203 271	- 54.1
Total Salaries and Wages ($000)	58 184	77 654	- 25.0
Cost of Materials and Supplies ($000)**	128 524	210 840	- 39.0
Export Shipments ($000)	51 572	133 397	- 60.7
Imports ($000)	6 390	5 024	+ 27.2
Total Employees	2 941	4 054	- 27.0
Number of Homes Shipped (excluding other buildings)	4 684	9 595	- 50.1
Average Value of Homes Shipped ($)	45 973	38 993	- 15.2
Mobile Homes (SIC 3242)			
Value of Shipments of Own Manufacture ($000)	102 279	159 776	- 37.3
Quantity	4 377	6 986	- 29.8
Average Unit Value ($)	23 367	22 870	+ 2.2

Source: Statistics Canada.

* Includes all buildings, i.e., homes, vacation houses, garages, farm buildings, camps, other buildings.

** Materials and supplies include: hardwood and softwood lumber, veneer and plywood; hardboard and particleboard; aluminum and other metals; hardware, plumbing, heating and electrical supplies; roof materials; doors, windows, kitchen cabinets, flooring, mouldings; wallboard and insulation; others.

Background

The manufactured housing industry began to take its present shape in the early 1960s as an outgrowth of the fledgling mobile home industry. In 1962, there were about 60 manufacturers producing 11 000 units a year (average production 183). By 1976, there were 185 manufacturers producing approximately 50 000 units a year (average production 292), with an installed production capacity of 100 000 units. In 1984, there were fewer than 100 manufacturers of all types producing about 8 000 units (average production 80 housing units).

The 1976 peak was realized when both the domestic and export markets were buoyant. Both markets thereafter contracted quickly and drastically, causing a strong rationalization and the disappearance of both large and small operators in all sectors across the country by 1981. Medium-sized companies, which happened to be well spaced in the market, tended to survive. The rationalization occurred not so much because the products were not competitive but because demand contracted and local sales volumes could not support large plants with high overheads. This was especially true of companies which had not been in business long and lacked financial depth.

The industry still has at least 50 per cent surplus production capacity on a one-shift basis. Available capacity is further increased by a number of easily reactivated plants which are now mothballed, and this situation applies across the country. Surviving companies have tended to have low-cost plants, diversified products, distinct market approaches and flexible design capabilities.

The core part of the manufactured housing industry consists of pre-cut package, component or panel and modular (including mobile double wides) companies. They offer standard residential accommodation in the new house market and are dependent on overall housing demand. These core subsectors of the industry comprise almost 55 per cent of manufacturers in Canada and are reported in housing starts statistics.

The general factors that affect the industry are demographic, based on projections of new family formations, financial, affordability as determined by prices and mortgage interest rates. The more specific factors that apply to the industry are local economic conditions and availability of competing products, primarily in rural communities and new towns outside the orbit of urban project builders.

The industrial camp and log house subsectors react to very different factors related to resource development and lifestyle preferences. They comprise roughly 30 per cent of all manufacturers.

The industry is oriented primarily toward low-rise housing and, in particular, to single-family dwellings as compared to semi-detached, row houses and apartments. It also is geared more to the private ownership market than to the rental accommodations market.

Housing Demand

Sales of manufactured houses are found in the low-rise housing sector, particularly single-family homes located outside urban areas where customers own individual building lots. Although for demographic reasons total annual dwelling starts are expected to decline, the single-family housing component is rising as a percentage of total starts. For example, in 1976 the single-family component was 49 per cent and, by 1983, had reached 63 per cent. However, the increase in single-family housing starts does not necessarily stimulate growth in the manufactured housing industry because most starts are by stick building project developers in and around urban centres where they control the supply of serviced lots.

The share of manufactured housing in the low-rise market has decreased both in actual numbers and as a percentage of total starts of late. It was estimated that the manufactured housing share was 42 000 units of 168 000 (25 per cent) in 1976 and 8 000 units out of 112 000 (seven per cent) in 1983.

This Canadian experience is contrary to share growth of manufactured housing in other countries, such as the U.S., U.K., Sweden and Japan, due in part to the economics of the housing markets and, in some cases, to favourable geographical and population factors, which have resulted in less on-site stick building competition in those countries.

Financial Considerations

Theory suggests that manufacturing should reduce the cost of house building through production efficiency. In practice, such savings are achieved but are virtually cancelled by the cost of product delivery, fixed plant overhead and limited demand, which become increasingly significant in a market downturn.

Financing is rather more troublesome for the manufactured home buyer than for the project house buyer as the purchaser has to arrange coverage for the lot, foundation, house package, erection and finishing separately rather than simply arranging a single mortgage.

Unless the manufacturer erects the home from footings to completion, something that is rarely done, the home may not be eligible in some provinces for coverage under a new home warranty policy.

Home manufacturers are paid f.o.b. plant and do not participate in mortgage draws during the construction period as on-site builders do.

Manufacturers tend to maintain labour forces with a certain amount of non-production time involved, while site builders contract completed work at set prices from subcontractors. This reduces the financial savings associated with manufactured housing.

Exporting

During the oil boom, approximately 10 000 Canadian manufactured homes and industrial camp units were erected in Saudi Arabia, Iran and Algeria. Since then, there have been some disaster relief sales but, in general, sales to those areas have dried up.

The current industry emphasis is on promotion of standard homes in industrialized countries. Entry into these markets follows acceptance of timber frame construction (TFC) techniques and is driven by demand for well-designed, economical, energy-efficient housing relative to traditional construction methods.

The industry has the ability to compete in some offshore markets and in certain areas of the U.S. (Florida, Texas and northern states). Some one dozen companies are now active in developing sales opportunities in the U.S., Western Europe and the Caribbean.

Canadian home manfacturers can benefit greatly from offshore, off-season sales. To do so, however, requires a long-term commitment by management of executive time and capital to establish an overseas market. Well-established, medium-sized companies are best suited to develop export opportunities. Individually, Canadian manufacturers, being small, lack the personnel and financial resources required for export trade promotion and development. The consortium approach was moderately successful in the mid-1970s, but no similar groupings of companies exist now.

Export possibilities exist for state-of-the-art housing in industrialized countries. These can and should be exploited. Export sales are considered necessary for the expansion, if not preservation, of the industry and leading companies within it, should the forecasted decline in housing demand materialize in the second half of this decade.

Competition with Site Builders

The manufactured housing industry is currently losing out to site-built house construction by project builders in urban areas. The industry is achieving its sales volume by offering quality-controlled, energy-efficient units and architecturally attractive component and modular homes in rural locations where such houses are not available from local sources.

In general, the industry has not yet been successful in supplying whole-house packages to subdivision developers, or in entering the multiple-unit row house and low-rise apartment markets. This is mainly due to the fact that most companies do not have adequate professional engineering and design staffs.

Escalating marketing and production costs for the manufacturer are reducing the industry's price competitiveness vis-à-vis site builders. One of the main concerns of the industry is that little serviced land is available for customers in urban areas. This is especially a problem for mobile home manufacturers where local building restrictions impede the entry of this type of housing in municipal areas.

Canadian houses must meet applicable provincial and/or municipal building codes, which in most cases incorporate codes and standards set out in sections (residential standards) of the National Building Code of Canada. These codes apply to site-built as well as manufactured housing other than mobile homes which, in most jurisdictions, must meet the Canadian Standards Association (CSA) Z.240 Standard. This code is national in scope but pertains specifically to mobile homes as a unique product.

Compared with the high level of competition between project builders in major urban areas, there is little competition between housing manufacturers in rural areas. Manufacturers tend to be quite local and to have definite markets for their products and distribution services. A few larger companies have interprovincial operations and compete with smaller local firms, but usually in the area of house design rather than quality or price. Site builders often compete with each other in project location and availability of consumer services, but such is not true of home manufacturers in rural and semi-rural areas. The manufactured home purchasers, as a first step, have identified the location where they wish to reside.

Size Range

Table II presents some principal statistics by manufactured housing plant size. Mobile homes are excluded. Those establishments with less than 20 employees represent 60 per cent of the number of plants in the industry but, in aggregate, have less than 15 per cent of total industry shipments and employment. At the other end of the scale, those plants with over 100 employees represent only six per cent of the establishments, but account for about 40 per cent of shipments and employees.

TABLE II

Principal Statistics Classified by Establishment Size (Number of Employees), 1982 (Mobile Homes Excluded)

Average No. Employed	Number of Establishments		Value of Shipments		Total Employees	
	No.	%	$000	%	No.	%
0 - 4	28	28	3 926	1.8	58	2
5 - 9	12	12	6 172	2.8	76	3
10 - 19	19	19	23 429	10.8	258	9
20 - 49	23	23	50 504	23.5	704	24
50 - 99	11	11	49 523	23.0	762	26
100 - 199	4)	4)				
	)	)	81 785	38.1	1 083	36
200 - 499	2)	2)				
Total	99	99	215 339	100	2 941	100

Source: Statistics Canada.

Three manufacturers stand well above all others in Canada with usual annual sales of about 1 000 houses each and production capacity of 2 000. About 15 manufacturers fall in the 100 to 500 per year range, and the remaining 80 or so plants each produce between 10 and 100 homes per year. The figure of 8 000 homes produced by 100 plants indicates an average of 80 homes per year per plant. These figures indicate that many plants produce less than 50 units per year or about one a week over a 40-week period.

Efficient plants require large floor areas, high clearances and large outside storage yards, but little in the way of high cost equipment. The 1970 operations, often in converted aircraft hangars, have given way to more efficient operations in purpose-built factories. A typical 100-house capacity plant will be on about thre hectares (eight acres), have 1 860m^2 (20 000 sq. ft.) of floor space, be worth about $3 million, employ about 25 people for nine months and be run by three executives. Sales at an average of $25 000 per unit suggest $2.5 million in sales and $100 000 output per production worker.

Companies with more or higher priced sales will have added professional level staff in the design, finance and marketing areas. Small companies are often

operated by owners who possess mainly technical skills. The more aggressive medium-sized firms are considering installing computerized administration systems and a few have installed computer-assisted design equipment and techniques in their drafting operations.

Only a few plants currently produce components for site builders. This is a potential growth area for the industry as demonstrated in the U.S. Larger operators may produce their own windows, pre-hung doors and manufacture trusses and cabinets but most small companies buy these products as subassemblies. Most plants operate at 60 per cent or less of capacity and are as productive as they need to be given present market conditions.

Labour Content

Most of the workers in the industry are semi-skilled labourers, and there is a ratio of about eight workers to one skilled tradesman or supervisor. Mobile home, modular home and industrial camp manufacturers install electrical, plumbing and heating equipment in their completed units and, therefore, require qualified electricians, plumbers and sheet metal tradesmen. Installers of finish siding, roofing insulation, gypsum wallboard, finish flooring and decoration are considered semi-skilled. Supervisors and foremen are often journeyman carpenters because of their overall knowledge of the structural assembly.

There is little unionization in the industry, but larger plants have employee associations. Labour relations are generally good throughout the industry.

Mass assembly techniques allow the hiring of semi-skilled people who can be recruited locally on short notice. Wages are often considerably below those for outside construction workers because of the advantages of more continuous work in better conditions. Labour supply is not now and is unlikely to become an industry problem.

Few women are employed in production work, as housing construction has generally been viewed as a non-traditional trade for women. They often manage and operate the offices.

Quality standards are high. Product control is the responsibility of experienced foremen, but there is usually no formal sign-off system.

Equipment operators are important for materials handling in the plant and yard and for product deliveries.

With some exceptions, notably with modular manufacturers, sales and marketing are often done at arm's length through distributors and agents. Staff sales personnel are the exception and may be a single sales manager. Most manufacturers deal through existing sales networks.

Professional designers are only employed by large companies, while small companies use diploma-level draughtsmen who have some architectural or engineering skills.

House manufacturing is rather more labour- than capital-intensive. It is an assembly operation where the value added stems from labour, overhead, transportation and the re-sale of purchased materials, household components and fixtures.

Marketing

In general, marketing must be considered a weak part of the industry. Too often it is under-funded and unprofessional. Although increased sales are vital, the cost of sales development is sometimes viewed by smaller firms as a reducible expense.

The progressive firms conduct market analyses and provide sales training programs for their representatives and dealers. The majority of companies, however, rely on feedback from dealers about local housing preferences. They produce inexpensive sales literature and some operate display homes or participate in local home shows to publicize their products. The leading companies produce glossy high quality sales brochures and advertise aggressively in newspapers and on TV.

The general approach is to follow rather than lead the market so that house designs are usually proven and conservative and can be economically factory-produced and transported.

The type and level of marketing expertise required for export development is rare in the industry, all the more so since it is not strong domestically. The ability to deal with foreign preferences and business procedures would likely have to be acquired, probably through joint ventures with foreign house builders.

Marketing by the industry leaders has centred on contemporary house designs and energy efficiency for upper-income buyers. This emphasis, along with extensive promotion, including good display homes, would serve them well in Canada, the U.S. and Western Europe.

CONTRIBUTIONS TO THE ECONOMY

Regional Distribution

Table III provides a provincial and regional breakdown of the numbers of establishments, production workers and value of shipments for manufactured housing, excluding mobile homes, in both 1982 and 1981. Of note are the dominant positions of the Quebec and Alberta industries and the significant declines that took place in all regions except Ontario in 1982. The Quebec industry was reduced to one-third of its 1981 production. The significant reductions in Alberta and British Columbia continued in 1983.

TABLE III

Regional Statistics, 1982 - 1981

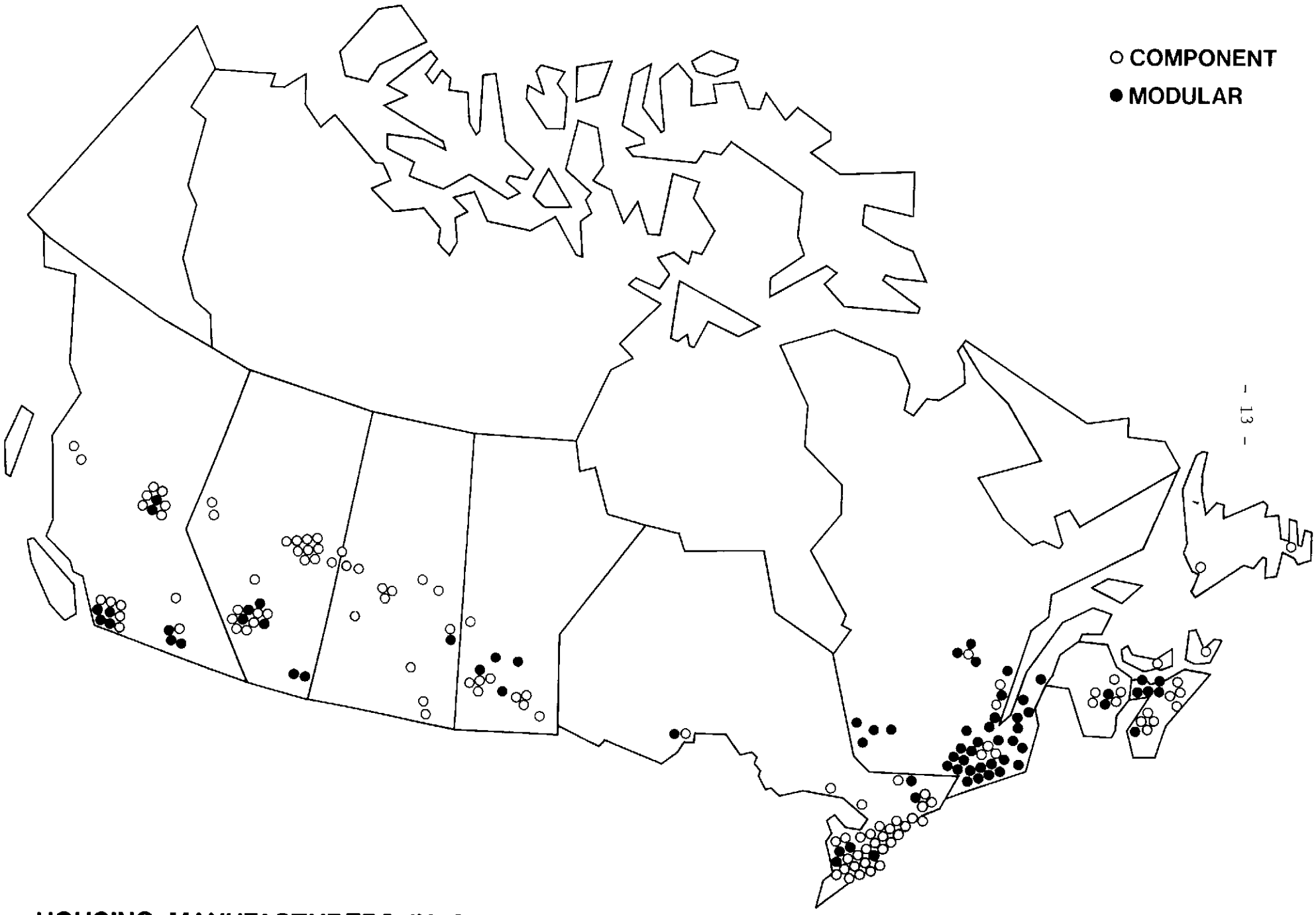
Province	Number of Establishments		Number of Production and Related Workers		Value of Shipments of Goods of Own Manufacture	
	1982	1981	1982	1981	1982 ($000)	1981
Newfoundland	-	-	-	-	-	-
Prince Edward Island	-	-	-	-	-	-
Nova Scotia	6	5	97	153	7 465	12 514
New Brunswick	1	1	-	-	-	-
Quebec	34	40	484	758	41 704	130 571
Ontario	11	13	235	267	26 897	28 167
Manitoba	7	6	34	-	2 285	-
Saskatchewan	3	4	-	37	-	5 296
Alberta	19	17	763	1 071	90 986	124 671
British Columbia	18	17	314	507	35 570	66 273
Yukon and Northwest Territories	-	-	-	-	-	-
Total Canada	99	103	2 029	2 890	215 339	374 117

Source: Statistics Canada.

In 1984, house factories were located across the country, and manufacturers were capable of supplying all areas. There were concentrations of production in the central Maritimes, in the Beauce region of Quebec, in south-western Ontario, central Saskatchewan, southern Alberta and the lower mainland of British Columbia. The plant locations were central to small town markets, had good road and rail facilities and were close to material suppliers. Older operations were often located in disused airport hangars, while newer plants were found in industrial parks. A number of older plants were combined with retail building material businesses, but this practice is diminishing as market demands become more specialized. Fewer plants are now outlets for building materials.

In 1976, the peak year, 185 plants produced about 50 000 units. In 1983, about 100 plants produced nearly 8 000 units. Since 1976, the reduction in the number of plants, both large and small, occurred in all parts of the country, but there were more closures of mobile home and modular home plants in Quebec, southern Ontario and British Columbia particularly. The map on the following page shows the present distribution of operating plants of the different types of products.

Present plant locations are not influenced by access to ocean shipping for export. However, plants close to Halifax, Québec City, Montréal, Toronto and Vancouver are already positioned advantageously for overseas delivery. e



HOUSING MANUFACTURERS IN CANADA

Edmonton is well placed relative to resource developments in the north. The completion of hydro-electric developments in northern Quebec has at least temporarily removed a strong market for Quebec manufacturers.

The stable continuous market, loosely defined as small-town, prosperous, rural Canada, dictates the location of plants, basically in the southern areas of the country. The north does not attract as many plants because of the much lower concentration of people and the shorter construction season. Southern plants can supply the north at relatively small additional transportation cost. Temporary growth associated with resource developments in areas like Prince Rupert do not justify new manufacturing facilities where market demand may exist for three years, but where a plant would need five years of operation to be profitable and most materials would have to be brought from the south in any case.

In the U.S. there is a much more uniform market since there are many more small towns close together. In the south and the south west (Florida, Texas, Arizona and California) there is practically a 12-month construction season and a large and growing senior citizen market, including many Canadians. In a very important way, Canadian expatriates form a significant part of the manufactured home demand in the U.S. Some central and western Canadian producers along the border are recognizing this situation and attempting to enter the winter market in the deep south. Expansion to the south is more attractive than in Canada, especially now when the currency exchange favours it. Some manufacturers across Canada have sold units in U.S. border states. However, Maritime producers find that, because their material costs are high, they cannot be price-competitive in the northeastern U.S., and their market is destined to remain local. Canadian-manufactured homes compete in the south mainly on the basis of superior design, quality and energy efficiency at equivalent prices.

Regional Impact on Employment

Manufactured housing, like the construction industry in general, is a seasonal employer, but not as much as logging and fishing. The industry is relatively small and widely dispersed. For these reasons, it does not have a big impact on regional employment, although in small communities plants can be relatively important as summer employers of casual labour.

In round figures, it is estimated that $1 million of annual sales is produced by 10 production workers. Larger volume plants can be more productive resulting in fewer employees, e.g., $20 million from 175 workers and $65 million from 425 workers. If an average price of a unit across the sector is assumed to be $25 000 (1984), then a worker produces four units worth $100 000 per year. Larger, more efficient operations may produce units of higher average value and/or more units per worker. The opposite, of course, may also apply.

The increasing use of preserved-wood foundations for manufactured homes which can be installed in winter might increase total sales and enhance year-round production and employment.

In general, because of their relatively small size and seasonal nature, manufactured housing plants are not normally major employers in urban areas, but can be significant employers in rural areas. Today the major operators will have about 80 employees, of whom 10 would be permanent, working on a one-shift basis for nine months of the year. Lay-offs are common in November, December and January. About 30 per cent of the labour required would be new-hire each year. Because of high levels of unemployment, casual labour is not in short supply.

Value Added

House manufacturing is essentially an assembly operation. The house product results from the purchase of locally available materials and equipment and applying labour to make subassemblies to be marketed, transported and erected. The value added comes mainly from labour applied in the assembly, transportation to and from the factory and marketing costs.

From Table 1, Principal Statistics, 1974-1982 for SIC 2543, Manufacturers of Prefabricated Buildings (Wood-Frame Construction), the average value added per year to the "value of shipments of goods of own manufacture" was 37 per cent. The same source shows that the various regions in Canada have similar value-added rates for the industry. This rate makes the industry a valuable contributor to the economy in relative terms.

In addition, many of the materials used in the assembly of a manufactured house are finished goods, such as kitchen cabinets, which themselves have a value-added rate of 33 per cent. The total house product is a valuable multiplier of the value of all its finished components (doors, windows, and appliances). When manufactured houses in a high state of completion are exported, they combine a high degree of value added from many other industries.

COMPETITIVENESS

Canadian Competitive Environment

While there is some competition between Canadian house manufacturers, it is not nearly as intense as in other sectors. Plants tend to be dispersed geographically so that transportation costs restrict the market radius. The various product categories are, by and large, sold into totally different markets, although there is some overlap between modular and panelized and between mobile and modular housing. Within each product category, companies offer lines that are in some ways unique, while variants are based on price, design, size and quality.

The main competition of Canadian modular and component house manufacturers across Canada comes from site builders, who dominate the low-rise housing market in general, almost totally so in metropolitan areas. Intense competition during the recent downturn was responsible in large part for the decline and rationalization of the house manufacturing subsector. In the last two years, this competition has increased as larger, more customized homes

have been built by project builders in metropolitan and urban areas. Home manufacturers with less flexibility compete in the scattered-lot rural market, where construction services are relatively less available.

The economic recession, coupled with high interest rates and the collapsed construction boom, particularly in Alberta and British Columbia, resulted in a competitive disadvantage for home manufacturing which carried higher fixed costs in plant overhead and inventory. High interest rates made new housing affordable mainly to the affluent, who chose to buy luxury homes from very flexible custom builders. Home manufacturers offered more standard, moderately priced homes for middle-income buyers. Because of low housing starts, carpenters normally employed by project builders operated as builders, working for wages without covering costs and profit, which manufacturers and project builders have to carry. These factors applied across the country, but mainly in metropolitan and urban areas. More normal markets are expected to return provided mortgage rates become stable and remain below 13 per cent throughout this decade.

An understanding of the Canadian housing market is important in fully appreciating the competitive environment and opportunities facing Canadian component and modular housing manufacturers. House construction includes low-rise and high-rise. Low-rise accounted for 72 per cent of total housing starts in 1983 (118 521 out of 162 645 units). Low-rise housing comprises single-family, semi-detached and row housing. Single-family housing is dominant and has increased its share of a declining housing market. In 1976, 134 313 units represented 49 per cent of the total 273 203 dwelling starts, and in 1983, 102 385 represented 63 per cent.

The Canadian manufactured housing industry mainly supplies single-family homes of medium price and size for erection on scattered lots in small towns and rural areas. The size of that market may be deduced from the following figures, of the three categories of low-rise housing in large and small centres across Canada and in small centres by region.

TABLE IV

Canadian 1983 Low-Rise Housing Starts, by Size of Centre

	Centres of 10,000 +	%	Centres of Less than 10,000	%	Total	%
Single-Family	77 579	83%	24 806	97%	102 385	%
Semi-Detached	6 230		385		6 615	
Row	9 217	17%	384	3%	9 521	%
	93 026	100%	25 495	100%	118 521	100%
% of Low-Rise Housing in Canada	79%		21%			

TABLE V

1983 Low-Rise Housing Starts in

Centres with Populations Less than 10 000, by Region

	Maritimes	Quebec	Ontario	Prairies	British Columbia	Total
Single Family	6 328	5 297	4 001	5 291	3 889	24 806
Semi-Detached	74	151	23	108	29	385
Row	98	122	24	30	30	384
Total	6 500	5 570	4 048	5 429	3 948	25 495
% of All Low-Rise Housing in Region.	52%	20%	10%	25%	21%	21%

Source: Canadian Housing Statistics, 1983.

Manufactured housing is now limited mainly to single-family units in areas of small population. It is estimated that the industry supplies about 30 per cent of this market. Rural housing dominates in the Maritimes, where it represents 52 per cent of total low-rise housing. Ontario is at the other extreme with only 10 per cent. On average, however, rural markets represent only about 20 per cent of all low-rise housing, with the remaining 80 per cent in larger centres. This relatively much greater volume of housing would suggest that manufacturers should be seeking ways and means to enter metropolitan and urban markets, not only for single-family homes, but also for semi-detached and row housing, as has occurred in the U.S.

Semi-detached and row housing has not caught on in any rural region of Canada, averaging only about three per cent of low rise housing. Recently, moderately priced housing in urban areas has tended to be multiple-unit town housing. This is not a well-developed market for manufacturers, although some of the larger companies, with architectural capabilities, have designed row house products and sold them through project builders.

A key reason for the lack of growth in the industry is control of land. Manufactured homes go onto lots and foundations owned by the customer. This amounts to a substantial down payment before the house is started and is mortgagable. Two problems thus arise: (a) the availability of single urban lots, and (b) financing, as compared to buying a fully mortgagable house and lot together in an urban location from a project builder.

In effect, manufactured houses are almost excluded from the major growth area - urban municipalities - because of the land factor. Most desirable serviced land is held by project builders, and the cost of these lots and services is fully mortgagable in the house price.

Mobile homes, although built to CSA standards, still suffer from the "tin can" image of a decade ago. It is difficult to obtain site approval for them from municipal authorities, and their competition and acceptance depend to a large extent on public tastes and attitudes. The industry is so small now that it is unlikely to become competitive with modular, component and site-built homes. Retirement and recreational communities of double-wide mobile homes are the best single markets, but are not large enough to use the industry's capacity. The few surviving mobile home manufacturers are maintaining operations by diversifying and building a variety of transportable buildings, encroaching somewhat on the industrial camp market for small numbers of specialized buildings such as site offices, portable classrooms, recreational mobile homes and garden sheds.

Some **component or panel house manufacturers** are cutting back on the production of wall panels in favour of shipping packages of cut-to-size lumber and sheet materials for site erection by low-cost, highly productive on-site labour. Such is especially true where these manufacturers compete in metropolitan and urban areas in Ontario. Thus the earlier trend to increasing in-plant construction is reversing. The main competitive factor between different companies in an area and site builders is in their architectural design capability and the delivery of a complete package of materials from one source. This type of service appeals to buyers who own land and can be their own contractors. Original pre-cutters have not had the design capability to compete in the upgraded market.

Log houses have always appealed to rustic home enthusiasts, but manufacturers are finding that this market has been severely restricted in Canada by attempts to conserve energy through high insulation value requirements. Log house construction is not price-competitive with standard stud wall construction. Many companies are modifying their wall construction to achieve higher insulation standards, even though they unanimously agree that experience with heating bills indicates it is unnecessary. Those manufacturers specializing in cedar logs are finding the sourcing of adequate material difficult and increasingly expensive, something that renders their pricing less and less competitive. The production of heritage-type prestige homes is increasing with proprietary designs and jointing systems.

Industrial camp manufacturers are in a highly competitive and severely reduced market. The large camp market has shrunk as resource development mega-projects have been curtailed in Canada and in the Middle East. Only a few companies have survived with enough capability to respond to any scattered opportunities. The large lease camp fleets of a few years ago are being sold at distress prices, thus drastically reducing domestic new product sales. Small companies and mobile home builders are mainly handling small contracts for specialized buildings. Export sales, which were strong for Canadian firms five years ago, have dropped substantially due to generally reduced demand, increased international competition and the diversion of production to more cost-effective production facilities in the U.S. and Australia. As a prime example, Atco Industries has established major plant operations in Saudi Arabia, Australia and Texas.

Modular home manufacturers, like mobile home producers, have experienced a major market reduction, and fewer than 10 per cent of them have survived the past six years. The demand for the small, standard bungalows they produced so efficiently for low- and moderate-income families has virtually collapsed, and existing firms now produce two- and three-storey units, row housing and custom designed homes as the market demands, and are gaining an increased share. The survivors have kept pace with designs offered by component manufacturers and site builders. Usually they are small family operations which, by careful management and hard work, have reacted quickly and developed high-quality, locally recognized product lines with full customizing capability. Transportation costs and problems restrict them to delivery radii of about 400 kilometres. Few companies are expanding their operations. Quebec has the largest number of plants, but the industry there has been particularly hard hit in the past six years. There is some strength in Ontario, Nova Scotia and New Brunswick where three companies are holding their positions.

Ready-to-move modular houses are competitive in the energy-conscious market of rural Saskatchewan. Manufacturers may attempt to widen their market area to include the U.S. by producing more easily transportable two- or three-unit modular homes.

International Competitiveness

Over the last five years, manufactured housing has continued to increase its share of housing in most industrialized countries. These manufacturing industries have established a strong base by achieving substantial shares of low-rise housing in those countries. While directly comparable figures are difficult to obtain, it is estimated that current shares are: 49 per cent U.S., 80 per cent Sweden, 35 per cent Finland, 15 per cent Japan, 11 per cent U.K. Much of this industrialized housing is wood platform frame, which is often more readily produced in the factory than other traditional forms such as brick on block in the U.K. or post and beam in Japan.

Contrary trends have prevailed in Canada, where panellized and modular housing manufacturers have experienced a significantly diminished housing market share. The 4 684 manufactured houses (excluding mobile homes) shipped in 1982 represented only 6.4 per cent of total low-rise housing and 3.7 per cent of 125 860 dwelling starts that year in Canada.

The higher percentage share in foreign countries is partially explained by differences in economic, institutional and geographic factors. These include the lower cost of servicing more accessible and concentrated populations, the supply of component packages and modules to project builders, the lack of site building tradition and capability, the acceptance of manufactured multiple-unit housing, an established manufactured housing industry with high volume and large economies of scale, shorter winters and year-round housing construction, less extreme cycles in housing demand and a more favourable image associated with house manufacturing.

The growth of manufactured housing in these countries has produced strong, very efficient companies, which are expanding into other countries. Swedish,

American, Japanese and British companies are competing with Canadians internationally, and some are exploring the possibility of establishing manufacturing facilities in Canada to supply both the Canadian and export markets.

Canadian house manufacturing technology helped to establish the industry, primarily in the United Kingdom and Japan. Domestic factory suppliers in the United Kingdom have taken over the production of wood-frame housing almost to the exclusion of site building. The United Kingdom as well as Japan, the U.S. and Sweden have large, modern domestic plants, many of which produce more than 2 000 units. In Canada, by comparison, the largest single plant produces fewer than 1 200 units, and the automated process is relatively more simple. The Canadian industry could learn advanced production techniques from these manufacturers, but can still offer leadership in architectural design and energy conservation techniques.

While the following paragraphs of this section will provide an overview of competing house manufacturing industries in the U.S., Japan and Scandinavia, mainly from the point of view of industrial structure and plant efficiency, it should be noted that the relatively small Canadian industry has competed successfully in international markets over the past decade. In the late 1970s, Canadian exports of industrial camps and housing for expatriates in the Middle East and other developing regions represented a significant share of Canadian shipments and helped sustain industry and company viability. While this level of success did not continue into the 1980s, as a result of the world economic recession and fewer large-scale development projects, a number of Canadian companies continue to compete and sell in international markets. The most favourable market, however, is the United States due to exchange rates.

Leading Canadian companies with relatively small plant size have flexibility of production and design to meet small order requirements economically. Moreover, the houses they produce have advantages in quality, design and energy conservation features. Panellized and modular houses are built to Canadian codes and standards, which have proved their integrity over time and which evolve to keep pace with the latest technological developments. Canadian companies have favourable access, at relatively economic prices, to materials and components such as lumber, plywood, windows, doors and cabinetry, which represent the major cost element to the industry. While transportation costs are significant and tend to place Canadian companies somewhat at a disadvantage in some world markets, they have been slightly offset by developments in containerization, the use of back-hauls for shipping and competitive trucking rates into the U.S. Canadian companies can provide expertise in housing erection and the management of turnkey projects. At a number of companies, management has the necessary experience for exporting to both industrialized and developing countries. While some firms have established their product, reputation, channels of distribution and joint-venture partnerships, large-scale export promotion and development can be an expensive undertaking and, as a result, is a significant constraint to Canadian companies.

The Canadian success in opening markets for factory-built wood-frame housing has not gone unnoticed by manufacturers of similar products in other countries. Large manufacturers from the U.S., U.K., Japan and Scandinavia are poised to make strong entries into other European, Caribbean and Pacific Rim markets in competition with both Canadian and local suppliers. If they succeed, it will be because of their size and ability to capitalize investment operations on a large scale. Canadian companies, which are small in relative terms, will undoubtedly have some difficulties competing against these major producers. However, they may benefit from the growing acceptance of, and demand for, manufactured wood-frame houses and be able to generate increased sales of state-of-the-art products. Export sales have the potential to support the growth of Canadian companies and improve their competitiveness both at home and abroad.

Several Canadian companies realize this fact and may seek further government assistance in promoting and marketing manufactured housing through demonstration projects and other promotional activities such as missions, seminars, trade shows and market analysis in selected countries.

Japan

In Japan, manufactured housing has increased its share of total housing from nine per cent in 1978 to nearly 15 per cent in 1984 and achieved a proportionately greater share of low-rise housing. Total units manufactured in 1984 were approximately 150 000. Structural materials include steel (61 per cent), wood (22 per cent) and concrete (16 per cent). The leading 10 companies have 97 per cent of production and the leading five have about 80 per cent. These five are Misawa (26 per cent), Sekisui House (21 per cent), Daiwa (13 per cent), National House (10 per cent) and Sekisui Chemical (9 per cent).

Manufactured housing in Japan has a different image than in Canada. There it is considered quality or luxury housing and commands a premium price, equivalent to that of traditional wood-crafted houses. For this reason, suppliers or component producers must meet exact specifications for products not necessarily found in the North American market. For example, Misawa sources lumber in Canada cut to custom dimensions and manufactures it into highly machined pieces with tolerances of 0.025 mm (1/1000th of an inch) for use in stressed skin panels.

The Japanese manufactured housing industry would appear to be the most highly automated and technically advanced in the world. The House 55 project, which began in the mid-1970s, targeted factory-produced homes using a variety of material combinations at 55 per cent of normal costs. While recent investigations have concluded that these targets have not been realized, some manufacturers are indicating a cost saving of at least 20 per cent relative to traditional Japanese post and beam. Some predictions suggest a 30 to 50 per cent market share for manufactured housing by 1990.

In addition to being controlled by large, highly capitalized companies with large-scale, automated plants, the Japanese industry puts considerable

emphasis on R&D for both process and product. Production automation features include robotics, continuously moving belt and roller conveyors, and computer-controlled workstations tied to a mainframe computer which regulate the entire operation. Several companies have laboratories which test houses under extreme weather conditions. With the aid of computers and knowledgeable salesmen, factory-built houses can be almost totally customized with respect to design, materials, finishes and other aspects. In addition, the Japanese manufactured house is now noted for its attention to strength and quality, including interior millwork detail. While Japan does not have a mobile home industry, its automated modular systems are adaptable to the North American mobile home product.

Misawa Homes Company Ltd. is a leading example of the Japanese industry. Founded in 1967, its current production exceeds 30 000 units per year with annual sales of $2.5 billion. A large Misawa plant would turn out 3 000 houses per year with 70 employees working six-and-a-half days a week. Of its 23 housing factories, 22 produce stressed skin wood panels and one builds a newly developed ceramic panel (limestone and silica) which apparently required 12 years of intensive research to develop. The company claims it can cut costs by 30 per cent through technological innovation, 10 per cent by improving distribution and 10 per cent by mass production techniques. It further claims to have reduced the labour time per house unit from 3 000 hours several years ago to 1 000 hours in wood prefabrication and to 250 hours in ceramic panels. The company's long-term strategy focuses on four areas of technological development: mechatronics (electronic automation in factory, office and home), new materials, biotechnology (converting the home to specific human needs) and sales automation.

United States

The U.S. manufactured housing industry is not as technologically advanced as its Japanese counterpart, but is far better established as an industry than is the Canadian industry. Manufactured housing in the U.S. has a more positive image and a substantially greater share of total housing starts (estimated to be 49 per cent of all single-family housing starts in 1984).

Despite relatively large manufactured housing companies and volumes, there is no single dominant manufacturer in the U.S. Several of the large producers have plants located to serve particular U.S. markets. As in Canada, a number of modular and panellized plants can produce economically with volumes as low as 100 units annually. Moreover, production facilities tend to be not highly automated although there is increasing reliance on advanced technology.

An article appearing in the August 1984 issue of the trade magazine, Automation in Housing and Systems Building News, provides production and sales figures for the top 100 home producers in the U.S. and indicates that those producers have achieved a 24 per cent share of the total U.S. housing market. Some idea of the scale of these operations is given by the figures for 1983.

TABLE VI

Revenues and Production of Largest U.S. House Manufacturers, 1984

	Revenue $000 000	Units
1. U.S. Home Corporation	$1 033	21 242
2. Pulte Home Corp.	839	11 008
3. A.G. Spanos Construction Inc.	780	13 340
4. Ryan Homes, Inc.	577	8,182
5. Centex Corp.	571	6 496
6. City Investing Co.	559	14 918
7. Fleetwood Enterprises	517	39 579
8. Lincoln Property Co.	495	12 509
9. Weyerhaeuser Real Estate Co.	420	4 326
10. The Ryland Group, Inc.	404	5 383
Total	$6 195	136 983

Source: Automation in Housing and Systems Building News, August, 1985.

The nearly 137 000 units produced by these 10 companies represent about 16 per cent of total estimated manufactured housing production in 1984. Total in-plant production grew to an estimated 853 000 units in 1984, with 57 per cent panellized, nine per cent modular and 37 per cent mobile.

Mobile homes, which have been upgraded to resemble modular homes, have continued to be a popular mode of housing in southern winter resort states. Large companies with multi-plant operations and sophisticated marketing capabilities have been major land project developers themselves and have developed large communities using their own house products. This trend is continuing and expanding in response to the aging population seeking sunny retirement accommodation. Owing to its climate, population and geography, Canada does not have a demand ratio comparable to those of the states of Florida, Texas, California and Arizona.

Scandinavia

The manufactured housing industry is well established in Sweden and Finland. As a building concept, manufactured housing is the preferred mode of single-

family accommodation in both countries and enjoys widespread public acceptance. The industry in Scandinavia resembles that of Canada more so than that in the U.S. or Japan. Although highly automated, it is not as technologically advanced as the industry in Japan due, in part, to the low number of housing units required annually in domestic Scandinavian markets and the low levels of demand for export sales currently experienced worldwide. In addition, Scandinavian manufacturers produce a different type of modular section and wall system than manufacturers in other countries.

Manufactured housing has a substantial share of the single-family, low-rise market accounting for nearly 90 per cent of all starts in this category in Sweden and 35 per cent in Finland.

In Sweden, manufactured housing dates from 1909. At present, 10 major housing manufacturers produce nearly 50 per cent of all manufactured housing units. Production in 1983 stood at 17 100 units, but declined by 15 per cent for all of 1984 to 14 500 units. The industry employs about 5 500 workers and approximately 80 per cent of all timber-frame houses built in Sweden are prefabricated in a factory and assembled on site. In addition to producing prefabricated houses, some manufacturers also produce cottages. This is not a large segment of the market as there are only six leading companies producing roughly 2 700 units annually.

As a result of declining domestic housing demand, Swedish manufacturers have aggressively pursued foreign markets for their products. Proximity to Western Europe, as well as preferential exchange rates and virtually free access to the European Community due to its membership in the European Free Trade Association (EFTA) provide Swedish manufacturers with a substantial trade advantage over Canadian, U.S. and Japanese manufacturers. They have been aggressively promoting manufactured housing exports to the U.K. through joint ventures, primarily for complete high quality housing. Swedish marketing techniques can be said to be more advanced than those of North America and Japan, and Swedish housing manufacturers are expected to remain competitive in the international prefabricated housing market in the near future. It is worth noting that one Swedish firm has exported houses to British Columbia and is considering establishing a plant in Yukon. Sweden may soon enter the U.S. and Mexican markets as well.

There are 20 manufactured housing factories of importance in Finland manufacturing low-rise buildings, the 10 largest of which account for almost 80 per cent of total output. The prefabricated wooden house industry in Finland dates from before 1940. Although the bulk of housing production is for the domestic market, Finland is a net exporter of housing and has been for over 35 years, since it started shipping houses to the U.S.S.R. Since the 1970s, Finnish manufacturers have gained entry into West Germany, Japan, Iceland, Turkey, Iran, Libya, Saudi Arabia and Nigeria, amongst others. Finland has promoted export market development as aggressively as Sweden.

Finnish quality and manufacturing techniques are internationally competitive. Manufacturers can produce panellized housing units as economically as they can

be produced in Canada. The trade advantages described for Sweden apply equally to Finnish manufacturers in European markets.

These Scandinavian countries, as well as Denmark, are intensifying their promotion of timber-frame construction through seminars, missions and participation in international trade fairs and exhibitions. In this regard, the Swedish government has recently established and funded an export trade promotion organization (SWEBEX) to promote the export of Swedish prefabricated timber-frame housing in world markets.

MEDIUM-TERM OUTLOOK FOR MANUFACTURED HOUSING SECTOR IN CANADA

Recent forecasts of new residential housing requirements by Canada Mortgage and Housing Corporation, based on future population and net new family formation trends, suggest declining levels of new housing activity to the end of the century. However, since manufactured housing now offers greater product variety competitively, it can be expected to increase its share of the new housing market and follow similar stronger trends in other industrialized countries. The table below provides a conservative forecast of manufactured housing shipments to 1996.

TABLE VII

Medium-Term Projections (Annual Rates)

Manufactured Housing Sector

1981-1996

(Constant 1981 $)

Market Component	Projected Annual Growth Rate	Projected Factory Shipments			
		1981 $000 000	1986 $000 000	1991 $000 000	1996 $000 000
Domestic Market					
New Housing	(+ 0.7)	190	197	206	224
Resource	(+ 1.9)	57	58	64	76
Exports	(+ 2.2)	131	145	162	180
Manufactured Housing Total	(+ 1.5)	374	400	432	474
Mobile Homes Total	(- 2.5)	160	100	100	100

Manufactured housing includes cut-to-size units, log homes, open and closed panel homes, modular units, industrial camps and other manufactured housing components. Mobile homes are accounted for separately in the projections since they form a distinct classification under Statistics Canada due to the fact that these units are produced to CSA Z.240 standards as opposed to other forms of manufactured housing which must conform to other provincial or municipal building codes.

In 1981, factory shipments of 9 595 manufactured housing units and 6 986 mobile homes totalled $374 million and $160 million respectively. Of the $374 million in manufactured housing shipments, actual housing units accounted for $219 million and other components for $155 million.

As a basis for the projections, it was estimated that, of the total 9 595 units, 4 863 units related to new housing demand, 1 356 units to resource development and 3 374 units to the export market. In the mobile home segment, the total 6 986 units related to domestic demand.

Rationale

1. Estimated annual housing requirements for low-rise dwellings are projected by CMHC to decline progressively over the period from $6.6 billion (116 000 units) in 1981 to $5.5 billion annually (96 900 units) in 1996. In the projections, however, the proportion of manufactured housing units, which was 5.4 per cent in 1981 (6 220 units), is expected to recover to a more traditional nine to 10 per cent share of the market, which it held in the 1970s. This forecast projects a recovery to eight per cent of low-rise starts in 1996, or 7 750 units.

2. Total shipments of manufactured housing devoted to resource development projects are expected to exhibit a modest year-to-year increase on the basis of mega-project activity forecast over the period ($7.7 billion annually by 1996). These projects are committed investments of more than $100 million and, as such, are virtually certain to be completed. The projection is conservatively estimated to be one per cent of these annual commitments as determined by the departmental mega-project task force. It should be noted that there is an additional $125 billion in planned and/or possible mega-project investment spread over the period. These figures have not been taken into account in the forecast because of their uncertainty.

3. Shipments from the manufactured housing sector devoted to the export market are also anticipated to exhibit modest growth over the period in spite of increased competitition from U.S., Japanese and Scandinavian manufacturers in these markets. Select market opportunities are anticipated to continue in the U.S. and, to a lesser extent, in Western Europe and Japan, where energy conservation is an increasing concern, and in areas where large development projects require additional camp accommodation. In the developing nations, on the other hand, where the need for basic shelter is rapidly on the rise, opportunities for the Canadian industry are considered limited because it is unprofitable and

impractical to supply the very small, low-price units required. As a result, the overall projection for export growth in the sector is a conservative 2.2 per cent.

Mobile home shipments are expected to reflect essentially a no-growth scenario over the forecast period to 1996. While total shipments stood at $160 million in 1981, they declined to $102 million in 1982, continuing the decline experienced by the industry since the mid-1970s, when rapidly escalating energy costs severely affected the sector. Factory shipments at that time were averaging 30 000 to 33 000 units and have consistently declined since then. A poor product image and very restrictive municipal zoning requirements have aggravated the problem. As a result, factory shipments have been forecast to remain at $100 million annually over the period.

Mobile homes, because of their relative architectural inflexibility, are unlikely to be increasingly involved in the project or luxury home markets in urban centres. They are likely to sustain and slowly increase their present market share in medium and small municipalities.

Modular home and pre-cut package home manufacturing is currently experiencing an upturn, primarily in Ontario. Log house manufacturing, which has a small national market share, also involves pre-cut materials and is not expected to demonstrate significant growth in market share.

Open panel or component houses are sufficiently flexible in design, production and delivery to meet the market demands of project builders and individual customers. Since the design aspect will continue to be important, the larger companies with this capability will prosper under good management and increase their market share. Small local companies seem destined to remain small and will be vulnerable to competition from larger companies. (In Canadian terms, a large company is one producing 500 or more houses a year.)

The market share of larger companies is likely to expand and export opportunities are likely to be available that will do a great deal to level out production cycles caused by the Canadian winter. Already, this subsector is moving toward greater export capability. As exporters gain experience and confidence, they are likely to maintain the necessary professional expertise year-round, which would benefit their domestic operations as well.

The industrial camp unit subsector does not respond to ordinary housing demand, but rather to resource development projects and disaster relief efforts in Canada and overseas. The Canadian mega-projects forecast three years ago would have stimulated this industry, but appear to have been shelved. It is expected they will be carried out slowly and be served by plants currently operating at undercapacity. A small mega-project may first require a construction camp that can accommodate a temporary workforce of 500, then 300 permanent houses.

MAJOR ISSUES

Capacity Utilization

Virtually all manufactured housing plants of all types across Canada have excess capacity. At present, most are operating at less than 60 per cent of full capacity production on a one-shift basis, even during peak summer months. Although double shifting is unusual in the industry, additional production capacity is available from second and third shifts, as well as from mothballed plants which can be put back into production.

The significant plant under-utilization in this sector is due, in part, to the decline in housing starts, the geographic distribution of population in Canada, the relatively low level of capital requirements for an efficient size plant and the relatively small share of total housing starts achieved by this industry. The problem is exacerbated by wide swings in housing demand as a result of economic cycles and seasonal weather conditions and the need for adequate production levels in peak periods of demand.

While declining product demand over the past five years has been most significant in Quebec, Alberta and British Columbia, the number of plant shut-downs has been correspondingly higher. As a result, operating rates in those provinces have been only marginally lower than in the rest of Canada. Nonetheless, the capability to shut down and reactivate plants at little cost contributes to chronic overcapacity in many regions of the country. Plant capacity was under-utilized even during the peak housing demand period of the early 1970s.

While break-even rates are well below 50 per cent, significant under-utilization of production capacity remains a major problem confronting all subsectors of the industry. The situation renders companies less effective when competing against large Scandinavian, U.S. and Japanese plants in international markets and against on-site builders which carry little in the way of fixed assets and plant overhead. A company in Japan can produce and sell 20 000 homes in a year. With such volume, the high cost of full automation can be justified.

Since plants in Canada are substantially under-utilized, there is little incentive to implement production improvements. Most companies see their needs in terms of increased sales rather than enhanced production efficiency. Even with the relatively high per-unit costs due to under-utilized capacity, manufacturers can compete effectively with site builders. A 50 per cent increase in sales would spread overhead and depreciation expenses and reduce unit costs.

Because house manufacturing is a factory operation, continuity of level production throughout the year is basic to production efficiency and cost reduction in many ways. This is virtually impossible for the industry to achieve when only serving the domestic market because of the three or four months of winter when shipments practically stop due to the unavailability of prepared foundations. A factory which operates at 70 per cent of capacity for eight months realizes about 50 per cent of capacity on an annual basis. If

all-weather foundations become more common, the construction season could be extended.

Company health would be considerably improved if sales and production could be maintained during the winter months. Increased and sustained local winter house construction would level out production and employment patterns. Offshore or U.S. export of products, preferably produced in the winter, also offers the advantages of levelled production and increased sales outside the local market.

In summary, under-utilization of production capacity will continue to plague this industry because many of the underlying geographic and economic factors are largely unchangeable. Notwithstanding that fact, the industry can mitigate the situation by achieving a greater share of on-site construction, by pursuing viable export markets and by finding ways to increase winter production.

Capital Requirements

Home manufacturing plant operations are not capital-intensive since they have relatively little high-cost manufacturing equipment. Computerized wall panel machines, which are used in some operations, can cost from $200 000 to $300 000, but most pieces of equipment, such as jig tables and multi-saws, are not major items. Materials handling and transportation vehicles are important but, unless sophisticated, are not costly. Nonetheless, long-established firms that have amortized these costs over time are in a more competitive position than new entrants, especially given the overcapacity situation in the industry.

A typical plant producing 100 units per year would cost about $3 million, $2 million for the land and building and the rest for machinery and equipment. Working capital requirements would ordinarily be in the range of $.5 million, most of which would be for inventory, relatively little for accounts receivable.

While a Canadian house manufacturing operation is generally a small business with low capital requirements for plant and equipment, it has a high need for adequate cash flow. It buys relatively finished goods and assembles them into packages. Typical purchased products include drywall, finish flooring, kitchen cabinets, windows, doors and sanitary fixtures. Cash needs come from regular payments for debt servicing, including monthly mortgage payments on plant and bank loans for operations, weekly payroll, inventory (30 days), and transportation, heat, light and power (30 days).

Marketing, where demonstration housing complexes are involved, can require significant capital outlays in the order of $250 000 per off-plant site with three or more houses. Properly selected, such sites can be appreciating land and building investments. Maintenance, staffing and furnishing are expenses that require high sales volume generated over perhaps a three-year period before a new model series promotion is successfully completed.

A typical problem develops because plants sell big ticket items of about $30 000 each one at a time with payment due on delivery. Manufacturers buy the component products in advance, usually in quantities sufficient for 10 units to take advantage of volume discounts for both materials and transportation. When orders lead production, the operation can run smoothly, but when orders lag, many extra costs develop. Accounts receivable are usually not high, although some companies complain about slow payment from governments that pay on turnkey completion rather than on a progress schedule or on delivery.

The cash flow problem cannot be alleviated by production for inventory or by progress payments on houses in production because each house product is likely to be different and the house is sold-to-order as a unit after production time of a week or two. Small operations are more affected by this situation than large ones, which have established a marketing network to produce the required flow of orders.

Some manufacturers have improved order generation by operating their own housing developments, assembling land and servicing, or by subcontracting to developers. However, these methods are usually not continuous, and the production as well as financial adjustments between, or at the end of, projects have been very difficult. Big, one-time orders have to be handled very carefully.

The requirement for design capability and professional staffing creates an overhead expense that must be spread over a large number of houses, but this cost appears to bring stability and growth and, in the end, more than pays for itself. To maintain design capability, it is usually necessary to have key personnel participate in company operations at a senior level.

Small plant operations must balance the lack of economies of scale with low depreciation and overheads. These have been achieved by using low-cost often inefficient buildings and equipment, by using low-key marketing techniques and by not employing professional-level managers and designers. All of these factors tend to mitigate against growth, and small operations tend to remain local and under the control of one person.

Modernization

Given the stage of development of the Canadian industry and the relative simplicity of the manufacturing process, modernization is not a major factor in this industry. Level of sales, capacity utilization, professional management, marketing and design are more significant for corporate viability and effficiency than the degree of modernization. This could change if the plant volume in the industry approached U.S. or Japanese standards.

Capital for modernization projects typically tends to be expended in stages rather than on a regular, year-to-year basis. Projects involve not only items of equipment, but also manufacturing techniques to improve efficiency or to diversify production from modular to panellized products. On average, over a

five-year or longer period, modernization expenditures would represent, at most, one per cent of sales.

The need for modernization is directly related to a growth plan and the size of the operation. Most small plants are reasonably efficient relative to their normal under-utilization of capacity. Growing and large plants seek to be more efficient, and modernization is a consideration if it can be forecast to be cost-effective.

Automated, electronically controlled production machinery is available at high cost. It has been used in Canada but not successfully due to fluctuations in demand. No plants in Canada are as highly automated as those of the leaders in the U.S. or Japan.

Computer graphics constitue a new and widely adaptable design and specifications aid to in-plant house design and sales office marketing. Such systems are in widespread use in Japan and are being introduced in Canada. At least three companies have installed computer graphics systems and several others are seriously investigating the potential of computer graphics.

Modernization through electronic administrative systems involving accounting, payroll and inventory are proving to be cost-effective for larger companies and may be used more by smaller plants as specific computer software programs are adapted to their needs.

Helpful modernization within plants related to production efficiency would be mainly in the areas of materials handling and inventory control in old plants and those which were not purpose-built and thus lack efficient materials handling capabilities. The storage and movement of inventory in such plants often only makes sense to the present operators. The antiquated systems can only be tolerated because of low production levels. On the other hand, capital expenditure to install rational systems and facilities is not justified if those systems and facilities do not lead to substantial growth and more level production.

Technology and Innovation

Research and development relating to the manufacturing process is not significant in this industry, although companies will install the latest technology and equipment where justified. Innovation in new and improved products is an important feature of the industry's development over a longer period, but, except for housing design, is not essential to company success or viability. Much of the basic and applied research in the structural and durability aspects of materials and components used in housing, as well as improvements to non-structrual components such as windows, doors and cabinets, benefit the house manufacturer.

The techniques of woodworking and component assembly are common to all plants. Differences are noted in the degree of product sophistication, the use of multi-cut saw machines, power-assisted jigs, conveyors, nailers and glue spreaders, none of which add innovation to the house product although they do improve the accuracy, speed and quality of construction.

Much of the innovation required to improve the quality and market acceptability of the manufactured house is of an ongoing nature and not easily isolated in a single new process or product alteration. Exceptions have included development of more easily transportable structures for industrial camps and different structural systems of wood-frame or other types of construction. While the latter are often intended to save materials or improve convenience, many such proposals have not proved technically or commercially successful.

Most of the advances in technology for this sector are likely to be related to energy conservation and more air-tight construction, geared to house design rather than production techniques. There are some movements to develop pre-insulated wall, floor and roof components that work in an integrated system. The same manufacturing problems arise with these panels as with closed panels because of the similarities between the two. In the area of log housing and similar pre-cut housing packages, research is required to develop new systems or to substantiate the notion that existing systems can compete under energy conservation standards and codes.

Apart from the ordinary sound business requirement of producing good houses to order, it appears that a key to growth is design in architecture, house structure and plant operations. Success has come to manufacturers that have professional staff who can design houses which are attractive in the marketplace, unique to the company as a supplier and economical to produce in the factory and erect on site.

The need for new technology and innovation comes from the marketplace. Sales rise or fall depending whether house buyers select products over those competitively available from manufacturers, site builders and the re-sale housing market. In most cases, design changes follow the market as new designs are originated by project builders, architects or American companies and accepted by new home buyers. Similarly, new materials and construction technology are usually adopted by manufacturers after being proven by other kinds of house builders.

Another area of technology advance is in the design of multiple housing units, row houses and apartments which can be assembled from factory-produced sub-assemblies and modules. Such systems are not new, but are rarer in Canada than in the U.S. The architecture and engineering of improved products for multiple-unit structures entails a development and engineering cost which would be beyond most Canadian manufacturers in this sector. In addition, the markets are generally small and localized in major urban centres so that producers outside such centres would not have the opportunity to participate. This situation is most likely the result of demand driven by developers with design staffs in joint ventures with manufacturers.

Financial innovations to make housing more affordable and increase market demand are likely to have more effect on the industry than improved production or even design technology. Subsidies and mortgage relief plans are usually organized to stimulate relatively low-cost new house construction and are widely used by residents of smaller, newer communities. Insofar as financial

incentives stimulate manufactured-house buyers, they assist the industry directly with sales of present models at least during the life of the program.

Innovative pricing (low base prices with optional add-ons) has stimulated sales for several companies. Most companies rely on quality products and customer satisfaction to generate increasing market shares. Manufacturers rarely finance their houses, although their sales representatives may assist in arranging financing through referral to real estate companies and banks.

Financial Considerations

The manufactured housing industry has been so reduced in size since the peak housing demand of the mid-1970s that surviving companies are lean and relatively sound financially. Profit margins are low, but levels of liquidity and solvency are adequate in most cases. Relations with banks are satisfactory and credit ratings acceptable.

Most of the companies are entrepreneur-owned and -operated, but a few operations or companies are part of large conglomerates. The industry is almost entirely Canadian-owned. The availability of capital is not a major constraint, although some of the smaller companies have stated that it restricts their ability to develop export markets.

Exports

The Canadian manufactured housing industry has achieved some outstanding export successes over the last 12 years. In the 1970s, the sector was highly export-oriented. Again in 1981, for example, exports accounted for 32 per cent of total industry shipments, as recorded by Statistics Canada.

In the mid-1970s, thousands of industral camp units, component and modular homes were sent to the Middle East and North Africa, mainly by about 10 companies. The market derived from urgent needs for housing in support of major industrial complexes, the erection of new towns and the upgrading of agricultural and educational facilities. Most of this business was profitable and led to manufacturing expansion in Canada.

As seen from the following table, these markets have deteriorated sharply in recent years as projects were completed and housing programs cut back due to decreased oil revenues, changed governmental priorities and wars. Some incidents of business mismanagement caused a number of company failures. Local suppliers and third-country competitors also began to take significant market shares.

TABLE VIII

Exports of Prefabricated and Ready-Cut Buildings and Parts

1973 - 1983

$000

Commodity Code - # 941-29

1973	$ 24 242	
1974	27 996	
1975	51 981	
1976	102 737	
1977	98 648	
1978	89 459	
1979	82 048	
1980	65 875	
1981	117 468	(Middle East)
1982	51 572	
1983	26 231	

In the past, experienced Canadian exporters have looked to Europe, the Pacific Rim and the Caribbean for new opportunities which, although much smaller in terms of demand than Middle Eastern markets, were relatively more stable. Recently, development of these markets has been somewhat thwarted by the strength of the Canadian dollar and the general economic downturn. Some Canadian companies have continued to sell housing to U.S. border states.

Future export prospects are reasonably good, although it is difficult to forecast international demand for Canadian-style housing. Market prospects are recovering and a number of Canadian companies are well positioned to participate in export business. Relatively small joint-venture projects appear to be available in industrialized countries. The mass market opportunities related to war damage reconstruction and Third World housing demand are further in the future and will depend on economic growth and recovery.

Nonetheless, many other countries have greater relative housing needs than Canada. The major component of the worldwide potential market is basic shelter housing for citizens of Third World and developing countries. The demand is for very low-cost homes (about $\$100 Cdn/m^2$) using local labour and materials, and projects are usually state-subsidized under specific social housing programs. Canadian house manufacturers operating as private, profit-oriented companies cannot normally compete at that level of cost in this segment of the world market, nor can manufacturers from other exporting countries. Occasional project-sized sales are made to countries who are recipients of Canadian aid. These low sales levels are not likely to change while Third World economies remain troubled.

Housing needs in industrialized, developed countries are for affordable homes for young and older people, replacement of obsolete homes and energy conservation. This market, although small compared to the mass shelter requirement in the Third World, is huge in total compared to Canadian demand. Western Europe and Japan are typical of this market, which is accessible to Canadian house manufacturers. Sales by Canadian suppliers of wood-framed manufactured homes in these areas depend on demonstrating that such houses meet social requirements, are acceptable under local building regulations, economically competitive and energy-efficient, and their introduction will provide an acceptable housing alternative without unduly upsetting the traditional house construction industry.

The post-war (1950s) need in Western Europe and Japan for low-cost replacement housing quickly generated local house manufacturing, utilizing concrete and block construction and other forms of housing, which often resulted in uncomfortable rows of look-alike, barrack-type, low-rise houses and austere high-rise apartments. Within a few years, it was realized that these forms were not long-term solutions to family housing, and national housing authorities began to seek alternatives. The desired alternatives were to have the following general characteristics:

The housing would

(a) be architecturally flexible to provide individuality and privacy;
(b) be assembled with efficient use of skilled labour and overall construction time;
(c) be heating energy-efficient;
(d) be able to be built in all kinds of weather, year-round; and
(e) be effectively quality-controlled.

Several countries investigated building systems worldwide and concluded that the Canadian timber-frame housing system, built in factories, offered the desired characteristics and advantages compared to their traditional masonry and heavy timber systems. The Canadian government co-operated with the industry to assist the transfer of technology and to provide access for a range of Canadian building materials. In the past 10 years, Canadian methods and materials have been adopted by foreign house manufacturing companies in a number of offshore markets.

Since there were no inherent wood house construction skills in offshore labour forces, stick building was not used; timber-frame housing started and has grown, primarily as a manufactured product, especially in the United Kingdom (1960s) and Japan (1970s). With concentrated markets, mass production was encouraged so that foreign companies tended to refine production techniques and apply computer technology to an increasing degree. Conversely, they have not emphasized architectural flexibility and many of their housing products tend to be lacking in appearance and livability.

In the early 1970s, a trade window existed for Canadian house manufacturers to supply house packages, often as demonstration projects, a situation which, in turn, encouraged local manufacturers to set up plants and take over the development of the market. This type of opportunity occurs as new country markets are opened by government and industry activity in timber-frame

promotion, which is currently taking place in the U.K., Japan, Korea, Germany, Belgium, France, Italy, The Netherlands and certain developing countries.

As noted above, since foreign manufacturers concentrate on mass production, Canadian companies have concentrated on offering contemporary house design and advanced energy-efficiency for upper-class housing markets.

Timber-frame housing and factory production are both new concepts in less developed countries, but they are of interest to government agencies abroad for providing both a housing alternative and new industry possibilities. This fact is recognized in Latin America, which could follow Western Europe as a market to be developed. Some Canadian manufacturers are becoming involved in government-sponsored starter studies with a view to the joint-venture selling of their technical expertise. The objective is to design locally acceptable wood-framed housing using local material and labour in newly designed manufacturing facilities. The sale of Canadian technology on a fee or participation basis has possibilities in the southern hemisphere, including Africa and Malaysia.

Similar opportunities can be foreseen for Canadians as war-torn countries try to industrialize replacement house production in the next decade, as in Lebanon and Iraq.

The Canadian house manufacturing industry is in a position to exploit future resource development opportunities as it did during the industrialization of the Middle East, when 10 000 Canadian homes were supplied to house construction workers and expatriate technicians in Algeria, Saudi Arabia and Iran.

Overseas countries are not likely to offer long-term mass markets for actual houses, but rather will offer short-term opportunities for demonstration-type sales and joint venture technology transfers with the possibility of royalties. Canadian expertise has widespread credibility and is known to be available to the extent that American, Scandinavian, British and Japanese companies may also choose this approach and become competitors in the technology transfer field.

Offshore markets in Western Europe, the U.S., the Caribbean and South America are seen as offering some select opportunities for Canadian wood-frame home manufacturers where their products can be promoted as modern, energy-efficient and economical relative to traditional construction. Such exports are highly desirable since production can be handled with present capacity and the products will not dilute the domestic market. Export marketing will likely have to compete with, but probably will be helped by, promotion from Scandinavian, Japanese and American manufacturers.

It usually takes about five years to achieve significant penetration of new markets. Timber-frame housing has been accepted to varying degrees in the U.K., Japan, France, Belgium, and the Netherlands, and is gaining acceptance in the Federal Republic of Germany, Italy, Korea and Greece. This acceptance is necessary before wood-frame manufactured housing can be commercially promoted.

In countries where entry of timber-frame housing has been achieved, small quantities of Canadian-manufactured homes were sold in the introductory demonstration phase. The successful sales encouraged production by local manufacturers using Canadian technology, methods and materials. In many instances, local manufacturers have prospered and developed and are now larger and more productive than Canadian producers. They have also captured a major share of the market. European housing authority investigators visiting Canada often determine that equivalent Canadian housing should undersell their traditional houses by about 20 per cent. In several countries, this margin of savings has been realized by local builders co-operating with Canadians. However, they see no reason to pass the saving on to the house buyer and sell just below market prices for traditional homes. Thus, Canadian houses sell on their merits and very profitably, but the cost advantage is not exploited and a higher pace of introduction is not realized. Nevertheless, it should be pointed out that Canadian manufacturers still enter the markets by providing homes of advanced contemporary design and energy efficiency, either through joint ventures or distributor agreements with local firms. Some Canadian companies have investigated the possibility of setting up manufacturing or assembly facilities abroad. It would not be an unrealistic expectation to see expansion in this area if greater market demand and acceptability occur.

Log home manufacturers had some export successes a few years ago as small quantities of chalet-type homes were shipped to Europe and Japan. Industry-leading companies were also involved in exporting recreation housing and buildings worldwide. Marketing costs and the strength of the Canadian dollar vis-à-vis European currencies have slowed sales in this market, but the potential still exists, especially in West Germany. Some small operations in Ontario, Quebec, Manitoba, Alberta and British Columbia are making occasional shipments of log packages for up-market homes for individual rustic home enthusiasts overseas, just as they do in Canada. When economic factors become more favourable, they will become more active. Because of its specialized market appeal, this industry sector does not participate in the direct benefits of standard wood-frame housing promotions. Export competition comes from Scandinavian suppliers of similar products in most markets. During the past year, Japan has become a promising market for log home manufacturers in western Canada. The U.S. market, because of the favourable exchange rates, perhaps offers the best opportunity for increased export sales for both eastern and Western Canadian log home manufacturers.

Canadian industrial camp building and modular house manufacturing companies developed world-class design and production capability in response to resource development housing needs in remote areas of the Canadian North in the early 1970s. From that base, they were able to adjust their products and processes to participate strongly in the large market which developed in the Middle East and North Africa during the oil boom. Many thousands of industrial units and modular houses were shipped to desert locations, where complete communities were created around oil fields, desalination plants and liquified natural gas projects, housing both native and expatriate technicians. As the mega-project market subsequently shrank worldwide, demand for Canadian-produced, transportable accommodation was reduced proportionally. Many of the producers have vacated the market and production facilities have

closed. Half-a-dozen manufacturers remain and maintain key personnel to respond to smaller opportunities for specialized structures. High production levels could be quickly reinstated if worldwide development resurges and/or emergency housing is required for the relief of victims of wars, earthquakes and floods, as the overcapacity situation in this subsector of the industry is significant. The major customers are governments and international contractors so that marketing is in the boardroom setting. Sales contracts are often awarded as much on production and delivery capability of suitable structures as on price. Competition from third- country, government-supported companies is a factor which Canadians find difficult to match. This industry should remain viable and equipped with personnel and plants to take advantage of future international opportunities.

For the future, potential export markets are available to all forms of manufactured housing. Entry into new markets has been through demonstration projects and is the preferred method, but it is often beyond the financial and personnel capabilities of the predominantly small companies to take advantage of new opportunities. It takes management commitment and the investment of considerable time and money over a number of years to realize them. Canadian credibility is high. The commercial exploitation of these markets is possible. Production for "offshore-off-season" markets will strengthen companies domestically. However, financing of entry demonstration projects is a key aspect of market development.

OTHER ISSUES

(a) Renovation

Canadian house manufacturers are not involved in the renovation market, and there is no indication from visits with industry leaders that they anticipate future involvement. Renovations are of the one-off type and do not lend themselves to factory production.

(b) Do-it-yourself (DIY) home construction has been a small part of the manufactured house market for the supply of cut-to-size material packages for shell houses. Sales of this type are mainly in areas, such as the Maritimes, northwest Ontario, Quebec and British Columbia, where numbers of young seasonal workers, for example, bush workers and fishermen, have some experience with wood-frame construction. Arranging adequate financing is the major constraint in this market since such houses have a history of not being fully completed. On the whole, the DIY market is not a growth area for manufacturers, but in some ways overlaps with sales of more complete packages for property owners who do their own general contracting and hire subcontractors.

(c) Northern housing has provided a small sporadic market for manufactured homes. Shelter housing is usually purchased by governments for erection in remote locations where there is a low local capability of house construction, a lack of materials and/or a lack of skilled labour.

To participate, the manufacturer has to be competitive in delivery and financing beyond normal requirements. Since the demand is sporadic and the problems large, only a few Canadian manufacturers specialize in this market, although a number of companies regularly respond to contract calls. Few have found it profitable.

(d) **Public image** of manufactured housing in Canada is, generally speaking, not as positive as it is in Japan, the U.S., Scandinavia and the U.K. This is partly due to an outdated public perception of these manufacturers as prefabricators with little design flexibility, small unit production and low-price product range. The component and modular manufacturers, which must meet the same building codes and standards as site builders, have not done much as an industry to counter these misunderstandings and to publicize quality and other advantages of manufactured housing. The industry is small and does not have an association.

For the last decade, mobile home manufacturers have fought to upgrade their units to have them officially recognized as structurally adequate and mortgagable. To this end, they have worked with the Canadian Standards Association to create high uniform standards of construction and a system of plant certification. The objective is to have Canadian mobile homes built to national standards which make the homes acceptable to homeowners, mortgage lenders and municipal authorities and equivalent to other forms of housing.

The CSA Technical Committee on Factory-Built Houses is responsible for the Z.240 series of nine standards which specify requirements for safety, vehicles, structure, plumbing, heating equipment, electrical, parks, windows and air conditioning calculations. CSA A.277 specifies the "Procedure for Certification of Factory-Built Homes" which applies to all manufactured housing.

Most Canadian mobile homes are now built to Z.240 standards in A.277 certified plants. Several provinces and most mortgage lenders will only approve units of this quality so that the standards also apply to imports. In the United States, most mobile homes conform to the "HUD Mobile Homes Construction and Safety Standards" which are not equivalent to Z.240 standards.

The Canadian mobile home industry has succeeded, through strenuous, responsible effort, in offering acceptable, affordable housing units, but the market has not responded and sales continue at an unsatisfactory low level.

FEDERAL-PROVINCIAL GOVERNMENT CONSIDERATIONS

It is essential to recognize the difference between the characteristics and markets of each of the manufactured housing categories. Manufactured housing is a viable alternative to site-built housing with flexibility of design and

advantages in quality. The industry has developed well beyond its early image associated with the term "prefabrication". Canadian manufactured housing has been proven internationally as a result of the large volume of exports shipped over the last decade to markets in all parts of the world. Substantial export opportunities will continue for leading, competitive Canadian companies.

Governments affect the Canadian manufactured housing industry in a number of ways.

(a) Building codes are adopted and enforced by provinces and large municipalities. Uniformity of applicable codes is important for manufacturers who supply many different jurisdictions.

(b) Financial support for new home ownership is usually initiated by the federal government and supported by the provinces. Short-term programs have created short-term demand stimulation but often longer-term problems as a result of market distortions. The industry needs input into planning government support programs.

(c) Provincial and municipal authorities virtually control the mobile home market through approval of site locations, parks and urban lots. Recognition of mobile homes as desirable housing would be a boon to young families and empty nesters.

(d) Federal, provincial and municipal governments are significant purchasers of manufactured homes and other buildings for departments, agencies and controlled corporations. They usually buy through public tenders for delivery throughout Canada and occassionally overseas.

Representative purchases from time to time include:

- homes for native people;
- homes for public servants and officials;
- schools, clinics, storage buildings;
- farm buildings;
- construction accommodation and offices;
- exhibition structures;
- subsidized social housing;
- aid-related housing overseas;
- special buildings for scientific research and exploration; and
- embassy offices and housing.

(e) Occasionally, foreign governments seek Canadian bids on their similar shelter requirements. In many developing countries, housing programs are the responsibility of the national government. United Nations agencies buy homes to house their officials.

(f) Federal and provincial departments and agencies have assisted companies in financing, product promotion and exports. The federal government has been successful in developing offshore market access by promoting timber-frame construction.

(g) Trade officers in Canada and in most Canadian embassies and consulates overseas are experienced in promoting Canadian housing-related products. Some provincial trade officers are becoming similarly equipped and co-operate with national offices.

(h) Departmental officers, in consultation with External Affairs, are directly involved in activities to support exports by Canadian companies. These activities promote timber-frame construction, which provides access for Canadian-type housing and building materials and products which include manufactured housing, materials and components such as doors, windows and cabinetry.

Such activities include:

- organizing incoming and outgoing technical trade missions consisting of architects, engineers, builders, officials, scientists, teachers and journalists;
- organizing technical seminars on Canadian housing;
- organizing participation in trade shows;
- encouraging and guiding Canadian business persons;
- sourcing of supply for product enquiries in export markets;
- collecting and disseminating market information; and
- liaising with housing and trade policy officials.

SUMMARY AND CONCLUSIONS

The Canadian manufactured housing industry comprises about 100 companies in total, operating in all provinces in Canada. These firms produced approximately 8 000 housing units in 1984. The heaviest concentration of companies is in the provinces of Quebec, Ontario, Alberta and British Columbia. This concentration reflects demographic trends and corresponding regional housing market demand. The industry encompasses manufacturers of six distinct types of products: cut-to-size packages, manufactured log homes, open panel or component houses, modular homes, mobile homes and industrial camp units. The industry employs nearly 2 500 workers in total and generated sales of about $200 000 000 in 1984. Export sales are not now a major part of industry earnings, but are significant to a number of leading Canadian firms.

At the time of writing, there are only five major companies in the industry which produce more than 600 housing units annually and employ more than 150 workers. The larger companies manufacture over 1 000 units yearly and have annual sales of about $25 000 000. The great majority of firms produce far fewer than 300 units per year and have correspondingly fewer employees. The sector is not viewed as a viable vehicle for increasing regional employment.

Although the industry is relatively small and widely dispersed throughout Canada, it has assisted the development of some support industries, most notably truss, frame, window and door, and kitchen cabinet manufacturing.

All areas of Canada are adequately served by the established manufacturers of housing products in the areas of accommodation, energy efficiency, design and affordability. The advantages and characteristics of manufactured homes are fixed unit costs, specified delivery, quality-controlled materials and fabrication, proven designs and customer service. Notwithstanding these advantages, however, the public image of manufactured housing in Canada has generally been negative.

The industry can be characterized as having a significant surplus plant capacity in all regions of the country. Capacity utilization rates are, at the time of writing, in the range of 50 per cent and less due to the declining demand for new housing stock. The house manufacturing industry as it now exists could quickly and easily double its level of production on a one-shift basis and triple production with two shifts.

A rather dramatic rationalization has taken place in the industry since 1978 when 185 firms produced housing products. Firms still producing in 1985 are likely to remain financially viable, lean and poised for improvement. To service present day markets, the industry utilizes production and equipment techniques suited to their sales volume, but few firms are highly automated. Production efficiency in the industry can be improved, but such improvement would require capital expenditures for automated production systems. Such expenditures do not seem warranted at present given the low demand for new domestic housing and the limited number of export sales. In general terms, the industry can be characterized as being not capital-intensive.

The main source of competition for housing manufacturers comes from project site builders located in large urban areas where housing demand is greatest. To date, imports of manufactured housing products are not significant factor for the industry, although it could be vulnerable to competition from Japanese, American and Scandinavian manufacturers in the long term, should tariff reductions subsequently occur.

The major demand for manufactured housing is for medium-priced homes on scattered lots in rural or remote areas owned by individual customers where local house construction capability is relatively low.

Most recent forecasts of new housing starts to the year 2000 indicate a downward trend in housing requirements over the period. Should projections hold true, this trend has significant potential implications for the future development of the industry. A number of major issues face the industry and will dominate its development to the end of the century. To survive as a viable industry and maximize its potential, the industry must concern itself with the overcapacity situation discussed above, which could be exacerbated by reduced market demand, gaining entry to the urban housing market from which it is now excluded and developing export opportunities for its varied housing products.

Export market development is crucial to the industry's viability. Currently, Canadian penetration of the U.S. and overseas markets is relatively low, yet the markets are large. Typical constraints to export development have related

to transportation costs vis-à-vis other housing suppliers in foreign markets and unfavourable exchange rates between Canada and other developed nations, with the exception of the U.S. Increased offshore export sales are possible, however, and highly desirable. Offshore, off-season housing sales would have the added advantages of utilizing current production capacity, maintaining skilled staff, reducing per unit overhead costs and would not dilute domestic markets. Limited access has been achieved in some offshore market areas where timber-frame construction has gained acceptance. Entry to foreign markets is dependent, however, on Canadian manufacturers' individual initiatives and their commitment of time and capital to organize demonstration housing projects, distribution channels and other types of product promotion and marketing.

Given the weak new housing demand forecasts for Canada, the industry should attempt to achieve significant U.S. market penetration in the border states, as well as in the southwestern states and Pacific coast areas. Market development should also be continued in Western Europe, the Far and Middle East and the Caribbean. Current favourable exchange rates between Canada and the U.S. would indicate this is a prime market area for export growth. Additional export sales would help ease the industry's present excess capacity.

Ideally, by 1990 the industry should achieve relative financial stability, expand its share of the domestic market for new housing, increase its export sales, smooth out the employment cycle, improve capacity utilization and achieve economies of scale and world competitiveness.

In order to realize these long-term development objectives, the industry should attempt to double housing production from 8 000 to 16 000 units and achieve a 10 per cent share of the domestic low-rise housing market. This would necessitate penetrating the urban housing market, which is dominated by land and project developers, and shifting some production into multi-unit structures. As a means of reducing overcapacity, the manufactured housing sector, excluding mobile homes, should strive to export 20 per cent of total production in selected export markets. This would entail commitment by management to export market development through investment in demonstration housing projects and concerted efforts by firms to explore and develop new market opportunities where practical consolidation within the industry and increased production efficiency should be sought. A rate of 70 per cent of capacity utilization on a one-shift basis should be targeted. These objectives could be met through an increase in the sales volume of the major export-oriented firms, and from them a commitment to modernizing production methods may be required in order to be competitive with large U.S., Scandinavian and Japanese firms. Although fragmentation in regional markets by smaller firms will persist, economies of scale should result among the top 18 companies, which account for the majority of production and employment.

In order to operate as a viable industrial sector, companies should be encouraged to address the issues of improving the public image of manufactured housing, increasing its share of the domestic market and developing export market potential. To do so, firms would do well to establish a national housing manufacturers' association with these objectives as its raison d'être.

APPENDIX

CONVERTED WOOD AND PAPER PRODUCTS DIVISION

FOREST PRODUCTS DIRECTORATE

RESOURCE PROCESSING INDUSTRIES BRANCH

DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

MANAGER

C.J. Copeland

OFFICERS AND RESPONSIBILITIES

G.D. Bird	-	Special Projects Involving All Product Sectors; Converted Paper Products: Institutional, Decorative (Wallpaper), Packaging - Coated, Laminated, Reinforced or Metallized Paper Packaging Materials and Bags
M.S. Hardie	-	Timber-Frame Construction, Manufactured Buildings (Including Houses), Structural Housing Components, Mobile Homes, Log Homes, Laminated Timbers
J.T. Melnyk	-	Kitchen Cabinets, Architectural Millwork, Remanufactured Products and Specialty Items, Handles, Brush, Broom, Mop, Charcoal, Fire Logs, Fencing, Wooden Containers, Wood Flour, Cooperage, Wood Turnings, Spools, Dowels, Woodenware, Miscel.
R.J. Aubrey	-	Millwork (Windows, Doors and Mouldings, etc.), Pallets, Hardwood Flooring, Furniture Components, Dimension Stock; Converted Paper Products: Consumer Disposables and Specialty Commercial