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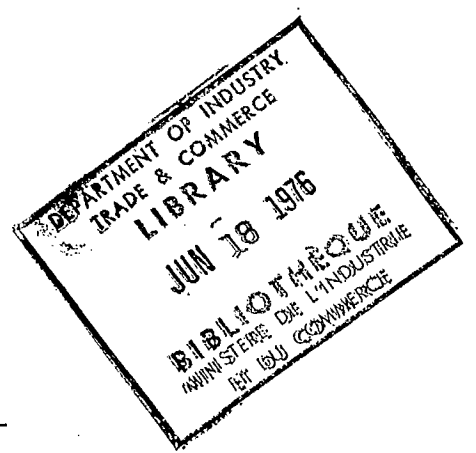
Summary of the

**CANADIAN MARKET POTENTIAL
FOR INDUSTRIAL PARTICLEBOARD
& PARTICLEBOARD PRODUCTS**



Industry, Trade
and Commerce

Industrie
et Commerce



THE CANADIAN MARKET POTENTIAL

FOR

INDUSTRIAL PARTICLEBOARD

&

PARTICLEBOARD PRODUCTS

S U M M A R Y

PREPARED FOR:

THE DEPARTMENT OF INDUSTRY, TRADE & COMMERCE
AND THE DEPARTMENT OF REGIONAL ECONOMIC EXPANSION, OTTAWA

BY:

COLUMBIA ENGINEERING INTERNATIONAL LTD. VANCOUVER

OCTOBER, 1975

This report is available in both
the English & French languages.

Ce rapport est disponible dans
les deux langues officielles,
l'anglais et le français.

Preface

The widespread interest in the development of new mills and growing reliance of Canadian users of particleboard on imports prompted the Departments of Industry, Trade and Commerce and Regional Economic Expansion to commission a market study with the dual objectives of determining the present and future consumption patterns for urea formaldehyde, resin bonded particleboard in Canada and to lay the groundwork for the development of a healthy and fully competitive domestic particleboard industry.

In March of 1975, the bid submitted by Columbia Engineering International Ltd. was selected from among nine proposals. The field work was started immediately and was completed by September, 1975. This volume, printed in advance of the main report, contains the Executive Summary. The main body of the report, including a sub-study of the U.S. market by Leonard Guss and Associates and demographic factors influencing the Canadian markets by Manex, Inc., will be published shortly.

The study team comprised the following:

Consultants Retained by Columbia:

D. McGillivray	Industry Interviews
J. Kassabgi	in Eastern Canada and
G. Brisson	Analysis of Data
Manex, Inc.	Demographic Study
Quebec City, Quebec	Data Processing
Leonard Guss & Associates	Overview of the United
Tacoma, Washington	States Markets

The Staff of Columbia Engineering International Ltd.

R. Horrobin	Interviews in Western Canada
E. Nemeth	Data Processing & Analysis
B. McIntosh	Background Research
P. McManus	
R. Cox	
P. Vajda	Data Analysis & Report Writing

Department of Industry, Trade & Commerce
Dept. of Regional Economic Expansion
Ottawa, October, 1975

Glossary

Particleboard: a panel material composed of small discrete pieces of wood which, after the application of an adhesive binder, are compacted by heat and pressure to cure the adhesive and form a rigid panel. Sometimes contracted to "board" (synonymous with panel).

Particleboards may be manufactured from a variety of raw materials cut into various types of particles by a variety of machines. These include:

Flakes, cut by a flaker from solid roundwood, along the grain of the wood.

Semi-flakes, manufactured by a ring flaker from pulp type chips which are cut (largely cross grain) by a chipper, from either solid wood or are generated by the chipping facilities of saw mills and plywood plants.

Random particles, derived by hammermilling either hogged waste, chips or shavings.

Fines, as contained in dry shavings or as generated by any form of the above milling machines.

Semi-fibers, made by milling shavings or sawdust by means of refiner (various types) at a relatively low power input.

Fibers, derived from milling green sawdust or chips through a single or double disc refiner at relatively high power input.

Pressurized fiber, a high quality fiber derived from a range of raw material forms, such as chips, shavings and sawdust, refined through "pressurized" (under steam pressure) refiner units.

Particleboards are classified by type of resin binder employed:

- (1) Type I - made with phenol-formaldehyde resin. Waferboard is of this type.
- (1) Type II - made with urea-formaldehyde resin. The report concentrates on this type which is abbreviated to "UF".

The particleboards considered in this study are mat formed only and are defined and described as follows:

Underlayment Particleboard (UL): Particle type: random or semi-flake, possibly fines on face; forming: homogeneous, three-layer or graduated; thickness: usually 3/8" or 5/8"; panel size: 4' x 8'; density range: 38 to 42, possibly 44 lbs/cu. ft.; mostly softwood furnish and urea resin binder; used under plastic flooring or kitchen countertops, although some underlayment grade is used industrially.

Mobile Home Decking (MHD): A higher grade of underlayment normally in density ranges from 44 to 46 lbs/cu.ft.; thickness is usually 5/8"; used as a combination of subfloor and underlayment in mobile homes; standard width: 4' and 5'; standard length: 12' and 14'.

Industrial Particleboard (Core Stock): Particle type: usually made with semi-flakes, semi-fibers and fines, could also be flakes; raw material: mostly softwood, some hardwood; density range: usually 42 to 45 lbs/cu.ft., some 50 and 55 lb. and some as high as 60 lbs/cu.ft.; urea resin binder; used mainly as core stock for furniture and cabinetry; low density products (28 - 30 lbs/cu.ft.) are used as door core; some 1/8" or "thin" board used as wall panelling; wide range of thicknesses but mainly 1/2", 5/8", 3/4", some 7/8" and 1-1/8"; product usually comes in 4' x 8', 4' x 9', 5' x 8', 5' x 9' full sheets, some 8' wide and some 12' long; also supplied in cut-to-size form; some special boards are identified either by species used in their manufacture or by special, fines-surface properties.

- (1) CSA Standard 0188 is under review at time of writing and this classification may be modified shortly.

Thin "Mende" Board: Conventional particleboards are manufactured on both multi and single opening presses. The Mende process manufactures continuous panels in 4' to 8' widths by means of a continuous press. Thicknesses range from 1/8" to 1/4". The product is intended to replace thin hardboards and thin plywoods for use as door skins, wall panels, core, or in furniture backs and bottoms. Thin boards may also be made on multi-opening presses for the same applications.

Medium Density Fiberboard (MDF): This product is manufactured by the use of usually pressurized refined fiber, bonded with urea formaldehyde resins. It is made in density ranges of 42 to 50 lbs per cu. ft. Some boards are made as high as 60 lbs/cu.ft. It is sold for the same application as 45 to 55 lbs/cu.ft. industrial particleboards although it is considered to have much improved edge and machining characteristics. It is mainly used to replace hardwood lumber or particleboard edge banded with lumber, or simply used as a panel which does not require additional edge banding or finishing. MDF is sometimes classed as a hardboard. For the purpose of this study and on the basis of the opinion of most observers, it is included in the particleboard family. The MDF consumption and production figures are included in this study in the overall particleboard data.

Waferboard: Structural or exterior grade panels made mainly with flakes or "wafers" (large flakes). These are grouped today under the heading of "waferboard". Waferboards as well as other structural particleboards such as the new oriented strand boards (Strandwood) -- strands are elongated flakes -- oriented fiberboards, standard hardboard products and medium density hardboard siding, all utilize phenolic resins and are meant for structural and/or exterior applications. They are not strictly included in the scope of this study although some comments are made.

Construction Users: All on-site building companies who receive raw board at the site and/or cut it up for installation. Generally includes uses such as underlayment, shelving, temporary or permanent site structures or partitions.

Industrial End-Users: Manufacturers who operate a plant(s) where particle-board is consumed in the manufacture of a product.

Prefinishers: Manufacturers who purchase raw U.F. particleboard from outside sources for the purpose of cutting-to-size and/or finishing it, in one way or another and subsequently selling to other end-users. In this study, the prefinishing category also includes Canadian particleboard manufacturers who have prefinishing departments in the same corporation.

Self-Finishers: Industrial end-users who purchase raw particleboard for cutting and/or prefinishing in their own plants as an integral part of manufacturing an end-product, e.g. a kitchen cabinet manufacturer.

S.I.C.: Standard Industrial Classification. The system employed by Statistics Canada of classifying Canadian industry into groups manufacturing approximately the same range of goods, in order to compile industry statistics. The S.I.C. categories employed in this study include:

- 252 - Veneer and Plywood Mills
- 2541 - Sash, Door & Other Millwork Plants
- 2543 - Manufacturers of Pre-Fabricated Buildings (Wood Frame Construction)
- 3242 - Non-Commercial Trailer Manufacturers
- 2544 - Kitchen Cabinet Manufacturers
- 258 - Coffin and Casket Industry
- 2619 - Household Furniture Manufacturers
- 264 - Office Furniture Manufacturers

266 - Misc. Furniture & Fixtures Manufacturers

404 - Building Construction

Volumes: These are expressed as a square footage times a standard thickness basis. In Canada the standard basis is 5/8", in the U.S. the standard basis is 3/4". Square footage abbreviations used in this report are:

Msf - Thousand square feet

MMSf- Million square feet

Bsf - Billion square feet

HISTORICAL BACKGROUND

Particleboard manufacturing originated in Europe prior to World War II. There, the major process developments as well as the largest growth in the production of particleboard took place during the fifties and the sixties, particularly in West Germany.

The concept of manufacturing and marketing particleboard was introduced to North America in 1948 and the early North American plants were based on European technology. By the late 1950's however, the European concepts were modified to conform to the raw material, marketing and general economic conditions peculiar to North America.

The European particleboard industry developed as a response to the need for a high quality wood-based panel which could be manufactured from the largely marginal forest resources of Western Europe. The plants were therefore based on the use of small roundwood and had low capacities. In contrast, the North American (mainly United States) particleboard industry was essentially motivated by the need to utilize the large quantity of residuals generated by softwood lumber and plywood plants. In the face of the abundant supply of both softwood and hardwood plywood and lumber, development of a particleboard market required substitution and penetration was difficult.

Starting from negligible production on both continents in the early 1950's, by 1973 European particleboard production grew to about thirteen million tons⁽¹⁾ per year, while North American production stood at about five

(1) One thousand square feet of 5/8" particleboard at a density of 42 lbs. per cu. ft. weighs 2,187 lbs. (1.09 short tons)

million tons per year.

While European plants were, and still are, characterized by the use of roundwood and relatively low capacities (presently averaging about 150 to 200 tons per day), in contrast, over fifty per cent of the present North American particleboard capacity is in plants with capacities in excess of 400 tons per day. Approximately ninety per cent of the U.S. plants are based on the use of non-chippable plywood and sawmill residuals, mainly sawdust, shavings and dry plywood trim.

European plants are located close to large markets whereas about 50 per cent of the U.S. particleboard capacity is located on the West Coast, mainly in Oregon and California at the sources of raw material but some 2,500 miles away from the major eastern markets.

In contrast to the United States, Canadian particleboard production developed mainly in the eastern part of the country and was influenced to a much greater extent by European technology and European thinking. As a result, Canadian plants are, with one exception, relatively small (capacity 160 tons per day or less) and, in some cases, have been based on the utilization of roundwood. These rather significant differences in the development of the U.S. and Canadian particleboard industries had far-reaching consequences. These may be summarized as follows:

- During the past decade, the large U.S. west coast plants have been shipping to Eastern Canada at a lower delivered cost, despite significant duty and freight charges, than eastern Canadian

particleboard plants. In effect, U.S. particleboard plants have dictated Eastern Canadian particleboard prices over extended periods.

- In the face of this stiff U.S. price competition, the financial record of the Canadian particleboard industry is, on the whole, less than satisfactory. As a result, the Canadian industry has been unable to expand sufficiently to meet actual Canadian demand. Increasingly, this demand has been supplied by board imported from the United States.

Table I-1 shows the growth of the U.S. and Canadian particleboard industries from 1964 to the present. U.S. production is about equal to U.S. consumption, except for 1974 when relatively large amounts of board were exported to Canada.

Imports are noted beside Canadian consumption in order to demonstrate the reliance of Canadian end user industries on imported particleboard.

CANADIAN CONSUMPTION OF U.F. BONDED PARTICLEBOARD IN 1974

The data from which the 1974 Canadian particleboard consumption was estimated and on which the trend in future consumption was derived, came from mail questionnaires and personal interviews with using industries.

Nearly 4,000 questionnaires were mailed out and over 700 interviews were conducted. The information received was then analyzed and evaluated by the staff of Columbia Engineering International Ltd. (CEI).

TABLE I - 1

COMPARISON OF CANADIAN AND UNITED STATES U.F. PARTICLEBOARD CONSUMPTION FOR THE YEARS 1964-74

YEAR	U.S.A.		CANADA				
	Production ¹ MMsf 3/4"	Consumption ² MMsf 3/4"	Domestic Shipments ¹ MMsf 5/8"	Imports ² MMsf 5/8"	Consumption		Can. Consumption as a % of U.S. Consumption
					MMsf 5/8"	MMsf 3/4"	
1964	639	630	68	2	70	58	9.1
1965	803	800	78	3	81	68	8.5
1966	1001	950	92	5	97	81	8.5
1967	1125	1050	95	10	105	88	8.4
1968	1440	1450	105	14	119	99	6.8
1969	1736	1700	122	32	154	128	7.5
1970	1813	1780	126	27	153	128	7.2
1971	2404	2340	187	48	235	196	8.4
1972	3282	3250	206	82	288	240	7.4
1973	3913	3820	230	134	364	303	7.9
1974	3494	3144	210	162	372	310	9.7

Source: U.S.A. 1 - U.S. Department of Commerce
2 - C.E.I. Estimates

Canada 1- DITC Estimates
2 - Statistics Canada, Catalogue 65-007
Class 33895 only.

1975 Plant Capacity

U.S.A.: 5.4 Bsf 3/4" (Includes MDF)

CANADA: 430.0 MMsf 5/8" (Excludes Waferboard)

The results of this part of the study are shown in Table II-7 and Figures II-1, II-3, II-4, II-5, II-7, II-8, II-9 and II-11 which are reproduced here from the body of the report.

Table II-7 shows the distribution of the 1974 consumption of U.F. particleboard in Canada, end using industries group (S.I.C. categories) and by region.

Figure II-1 illustrates the distribution by end using industry and Figure II-3 the distribution by region.

The exhibits show that over 400 MMsf 5/8" of U.F. particleboard was consumed in Canada in 1974 which is ten per cent in excess of the consumption figure developed by the Department of Industry, Trade & Commerce using estimated U.F. production and import data published by Statistics Canada.

Apparent consumption is based on estimated domestic production less exports plus imports. Columbia Engineering feels that import volumes reported by Statistics Canada in class 33895 are low and after checking with the Canadian and U.S. plants (those exporting to Canada), has reconstructed the probable 1974 supply of unfinished U.F. particleboard as shown in Figure II-4. The study concludes therefore that nearly fifty per cent of the domestic consumption in 1974 came from imports. Statistics Canada does not separate the production of U.F. particleboard from waferboard in its monthly report (Catalogue No. 36-003). Therefore, to determine consumption data requires an estimation of the relative volumes of each type to be made. In 1976, the monthly particleboard report will be revised to show production and shipments

of each type separately.

As shown in Table II-7 and Figure II-1, about 23 per cent of all raw board consumed was sold to the "Veneer and Plywood" sector. The manufacturers in this S.I.C. category have been labelled "prefinishers" and they overlay the board with veneer or plastic surfacing material and then re-sell it either directly to industrial end-users or through the retail distribution systems to other end-users. Some particleboard manufacturers prefinish some of their own production. This self-finished board is also counted in this S.I.C. category and the finishing departments of Canadian particleboard manufacturers are thus considered prefinishers.

Figure II-5 shows the analysis of the volume of prefinished board used in Canada in 1974 by type of prefinish and it can be noted that certain types of prefinished board, vinyls and some direct printed panels, were imported due to an excess of Canadian demand over domestic prefinishing capacity for these products.

All particleboard is eventually finished in some way, if not by prefinishers then by the end-users. Figure II-7 shows the analysis of the board finishing activity in 1974 broken down by type of prefinish as executed either by "prefinishers" or other industrial end-users as an integral step in their manufacturing process. This latter group have been categorized as self-finishers.

Figures II-8 and II-9 show the distribution of board thickness by region and by end-using industry respectively, demonstrating the dominance of the 5/8" thickness in the Canadian particleboard markets.

PROFILE OF THE 1974 CONSUMPTION OF U.F. PARTICLEBOARD IN CANADA

TABLE II-7

VOLUMES IN MMsf-5/8"

SIC#	DESCRIPTION	B.C.	PRAIRIES	ONT.	QUE.	ATLANTIC	TOTALS	
							VOLUME	%
	INDUSTRIAL:							
252	Veneer, Plywood-Prefinishers	5.4	-	50.8	28.2	8.6	93.0	23.0
2541	Sash, Door & Millwork	1.7	1.5	6.4	3.1	-	12.7	3.1
2543	Prefabricated Buildings	3.9	3.7	0.3	1.8	-	9.7	2.4
3242	Mobile Homes	5.9	12.3	9.5	8.6	1.3	37.6	9.3
2544	Kitchen Cabinets	8.1	0.8	24.7	7.6	0.9	42.1	10.4
258	Caskets & Coffins	-	-	-	0.2	-	0.2	-
2619	Household Furniture	0.8	6.1	35.1	49.2	0.1	91.3	22.7
264	Office Furniture	-	0.1	6.2	9.1	-	15.4	3.8
266	Miscellaneous Furniture	0.8	4.1	20.6	3.5	-	29.0	7.2
	Total Industrial Consumption MMsf 5/8" Basis	26.6	28.6	153.6	111.3	10.9	331.0	81.9
	%	8.0	8.7	46.4	33.6	3.3	100.0	
	CONSTRUCTION & DISTRIBUTION:							
404	U.L. & Wall Panelling ¹	10.5	12.0	13.0	14.0	3.3	52.8	13.1
	Miscellaneous Distribution	3.5	4.0	5.5	4.5	2.7	20.2	5.0
	Total Construction Consumption MMsf 5/8" Basis	14.0	16.0	18.5	18.5	6.0	73.0	18.1
	%	19.2	22.0	25.4	25.4	8.0	100.0	
	TOTAL CONSUMPTION MMsf 5/8" Basis	40.6	44.6	172.1	129.8	16.9	404.0	100.0
	%	10.1	11.0	42.6	32.1	4.2	100.0	100.0

Source: C. E. I. Research.

¹ Not Including Waferboard.

FIGURE II-1 - VOLUME & PERCENTAGE DISTRIBUTION BY END USER CATEGORY OF CONSUMPTION OF UREA BONDED PARTICLEBOARD IN CANADA - 1974

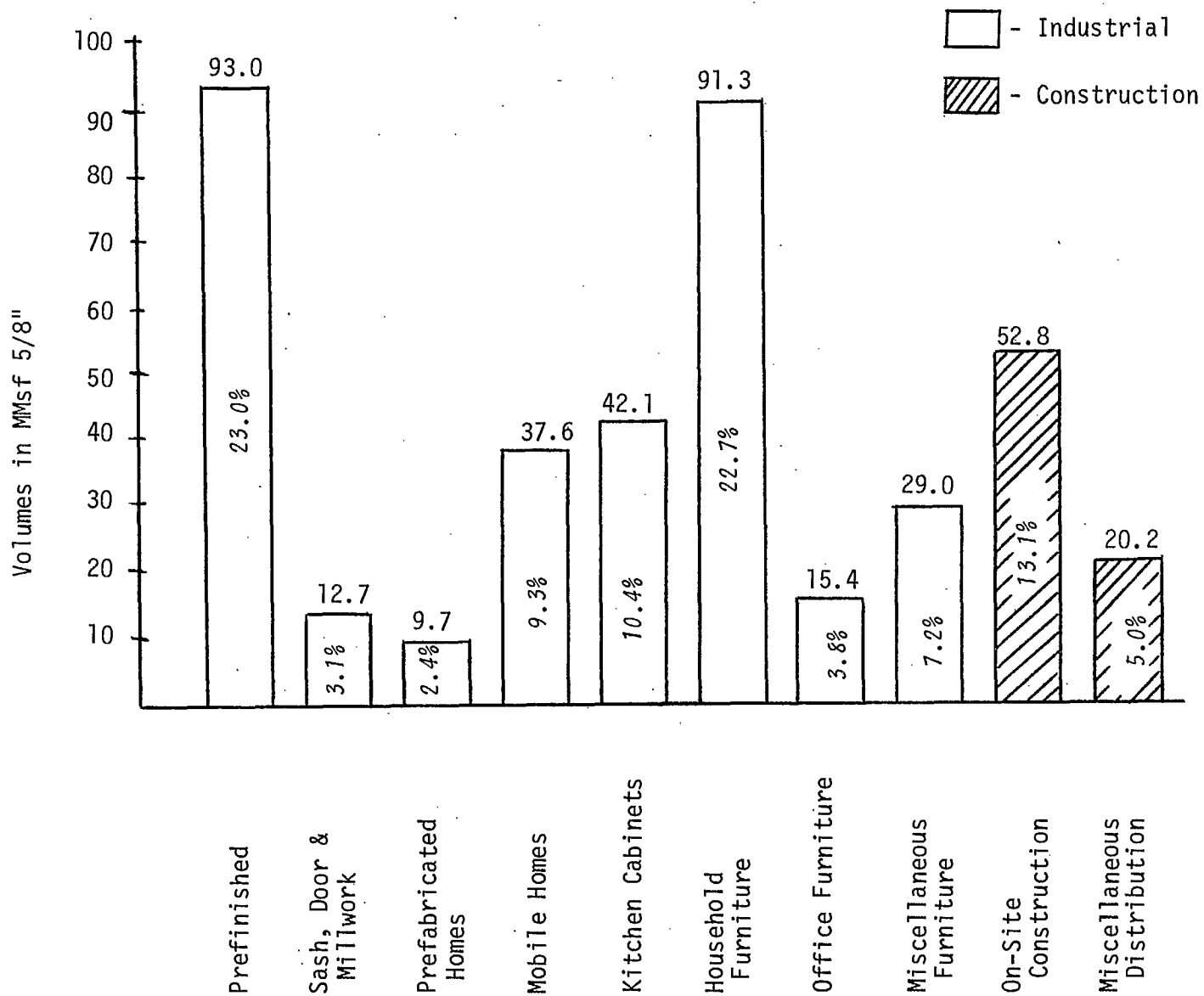
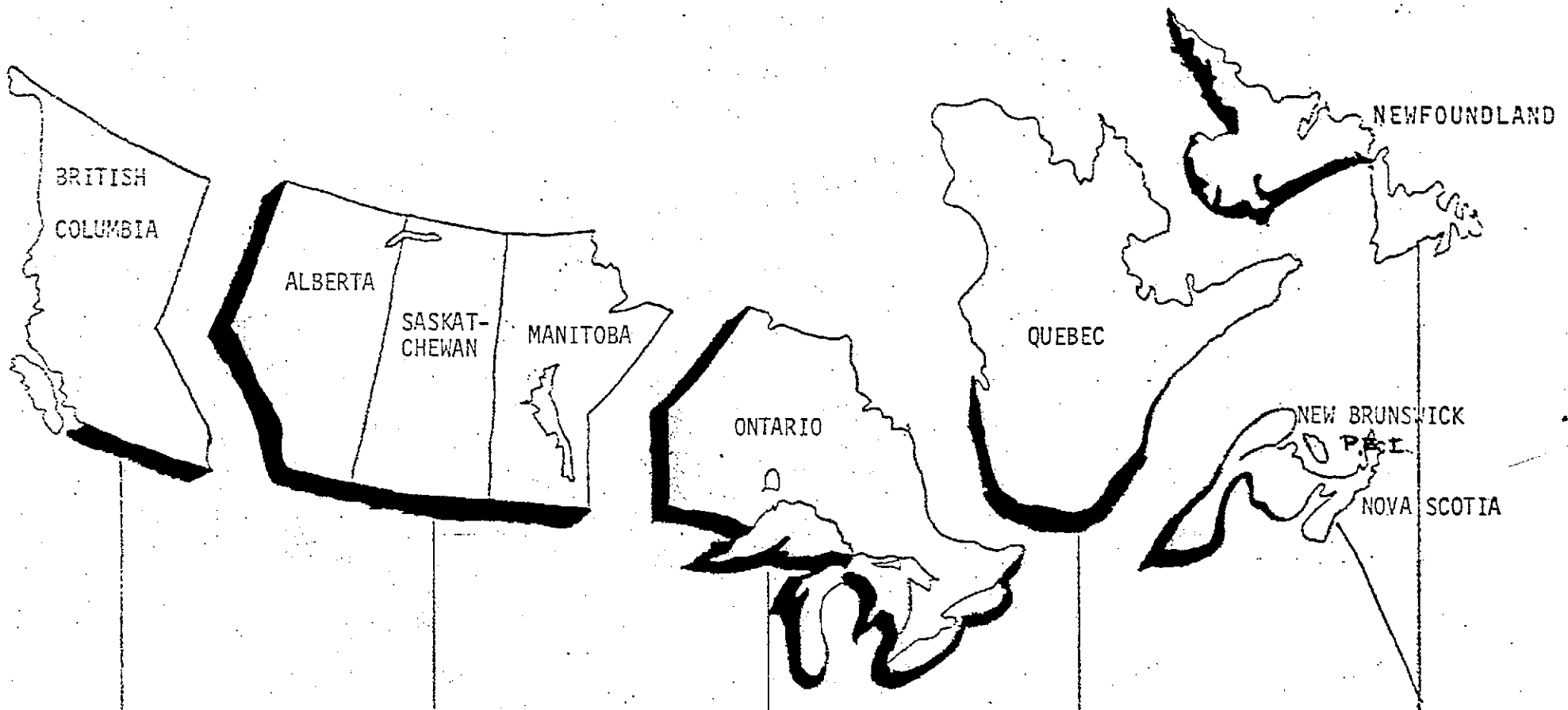


FIGURE II-3 - REGIONAL DISTRIBUTION OF CANADIAN CONSUMPTION OF U.F. PARTICLEBOARD IN 1974

VOLUMES IN MMsf-5/8"



<u>BRITISH COLUMBIA</u>	
Consumed:	
Industrial	26.6
Construction	14.0
TOTAL	<u>40.6</u>

<u>PRAIRIES</u>	
Consumed:	
Industrial	28.6
Construction	16.0
	<u>44.6</u>

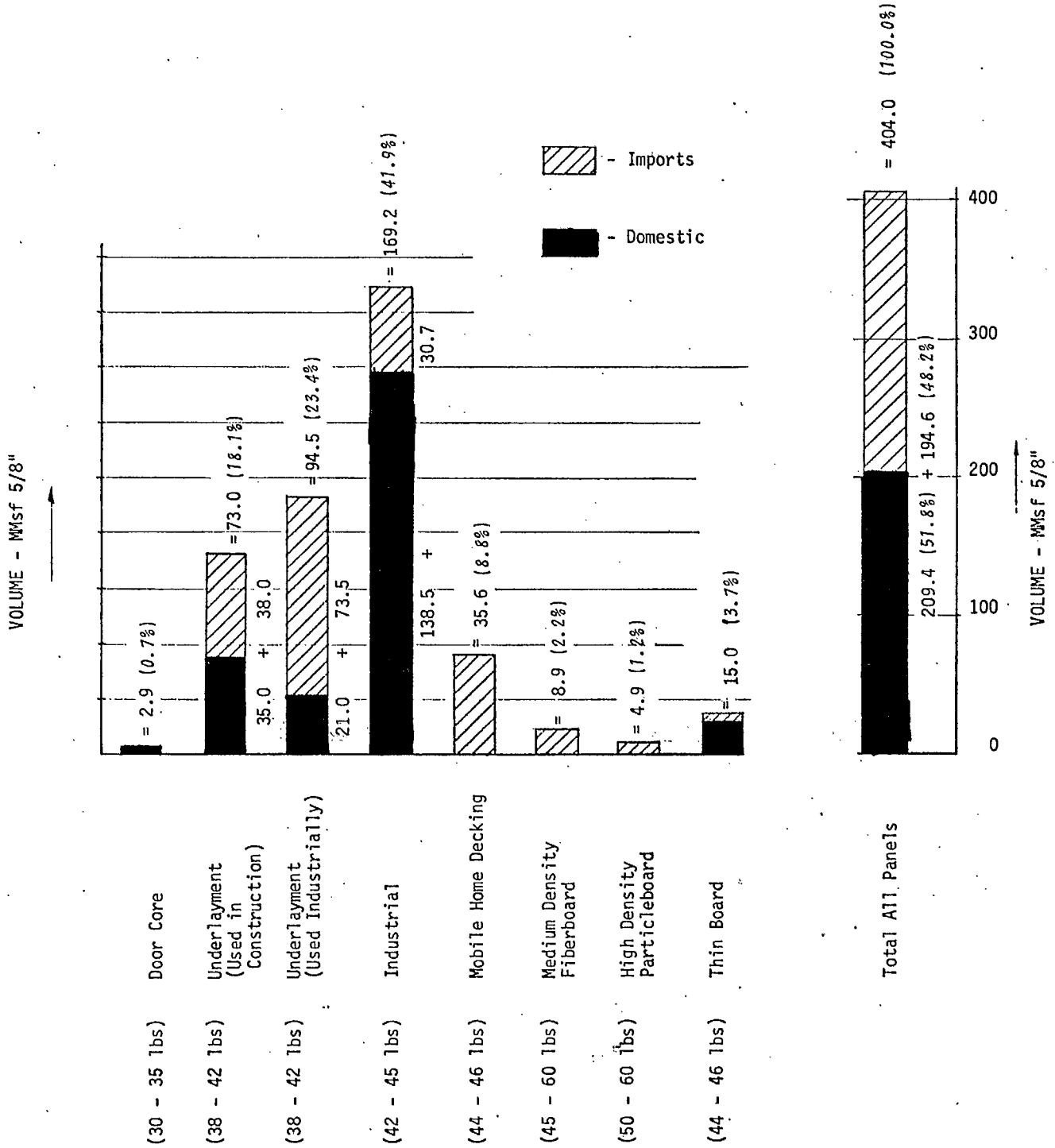
<u>ONTARIO</u>	
Consumed:	
Industrial	153.6
Construction	18.5
	<u>172.1</u>

<u>QUEBEC</u>	
Consumed:	
Industrial	111.3
Construction	18.5
	<u>129.8</u>

<u>ATLANTIC</u>	
Consumed:	
Industrial	10.9
Construction	6.0
	<u>16.9</u>

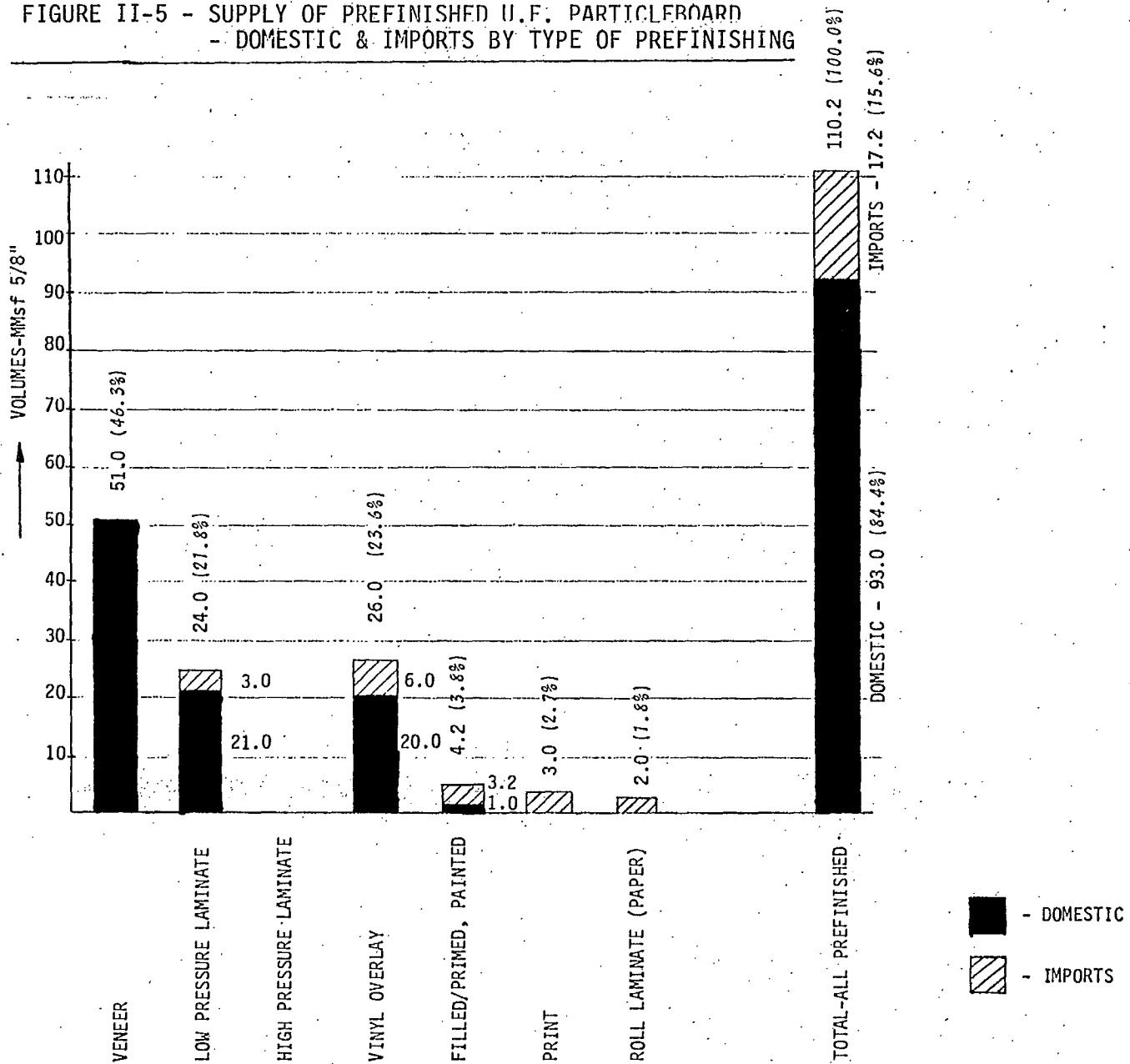
Source: C. E. I. Research.

FIGURE II-4 - PROFILE OF THE 1974 U.F. PARTICLEBOARD SUPPLY BY PANEL TYPE AND SOURCE



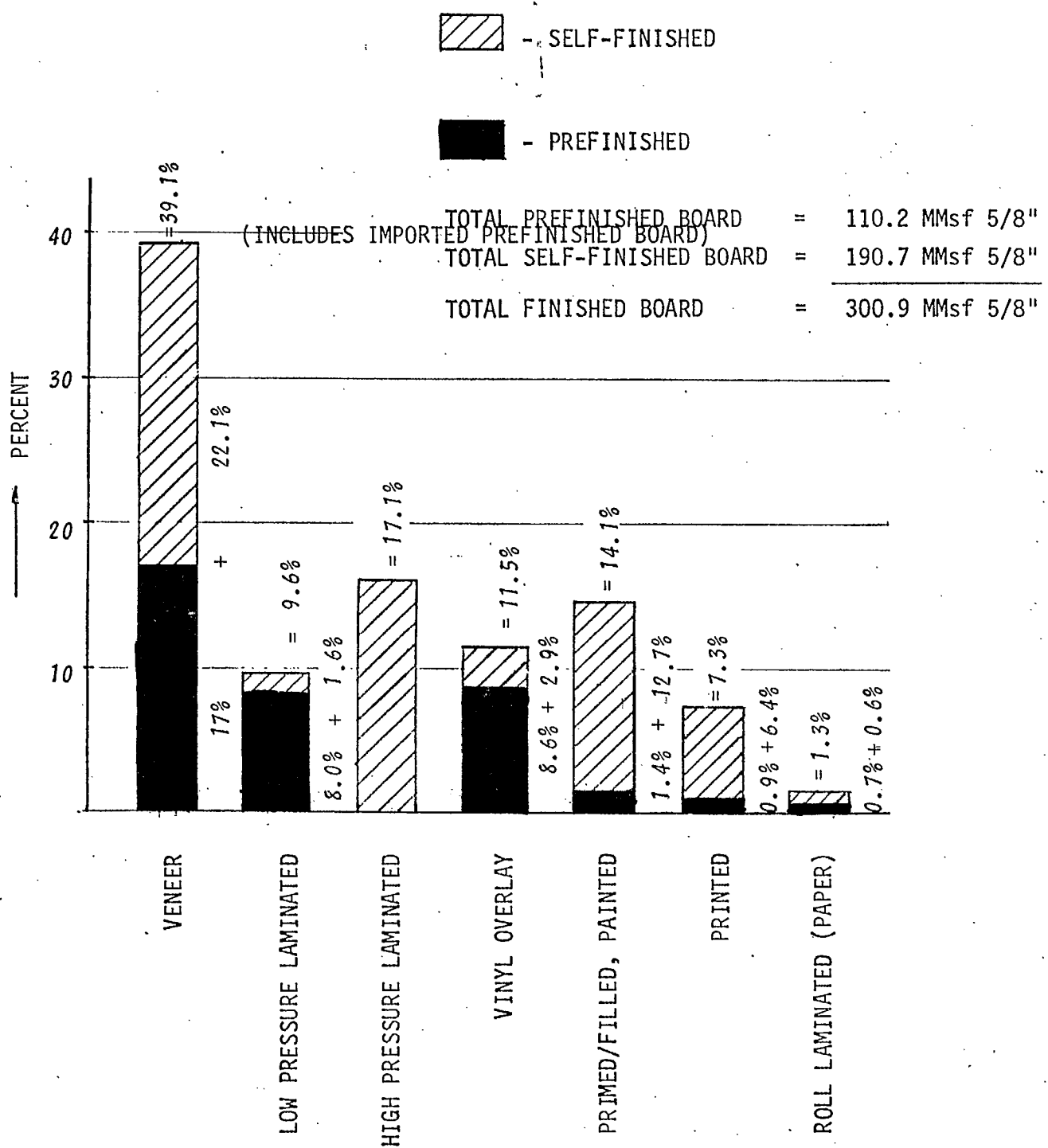
Source: C.E.I. Findings & Estimates

FIGURE II-5 - SUPPLY OF PREFINISHED U.F. PARTICLEBOARD
 - DOMESTIC & IMPORTS BY TYPE OF PREFINISHING



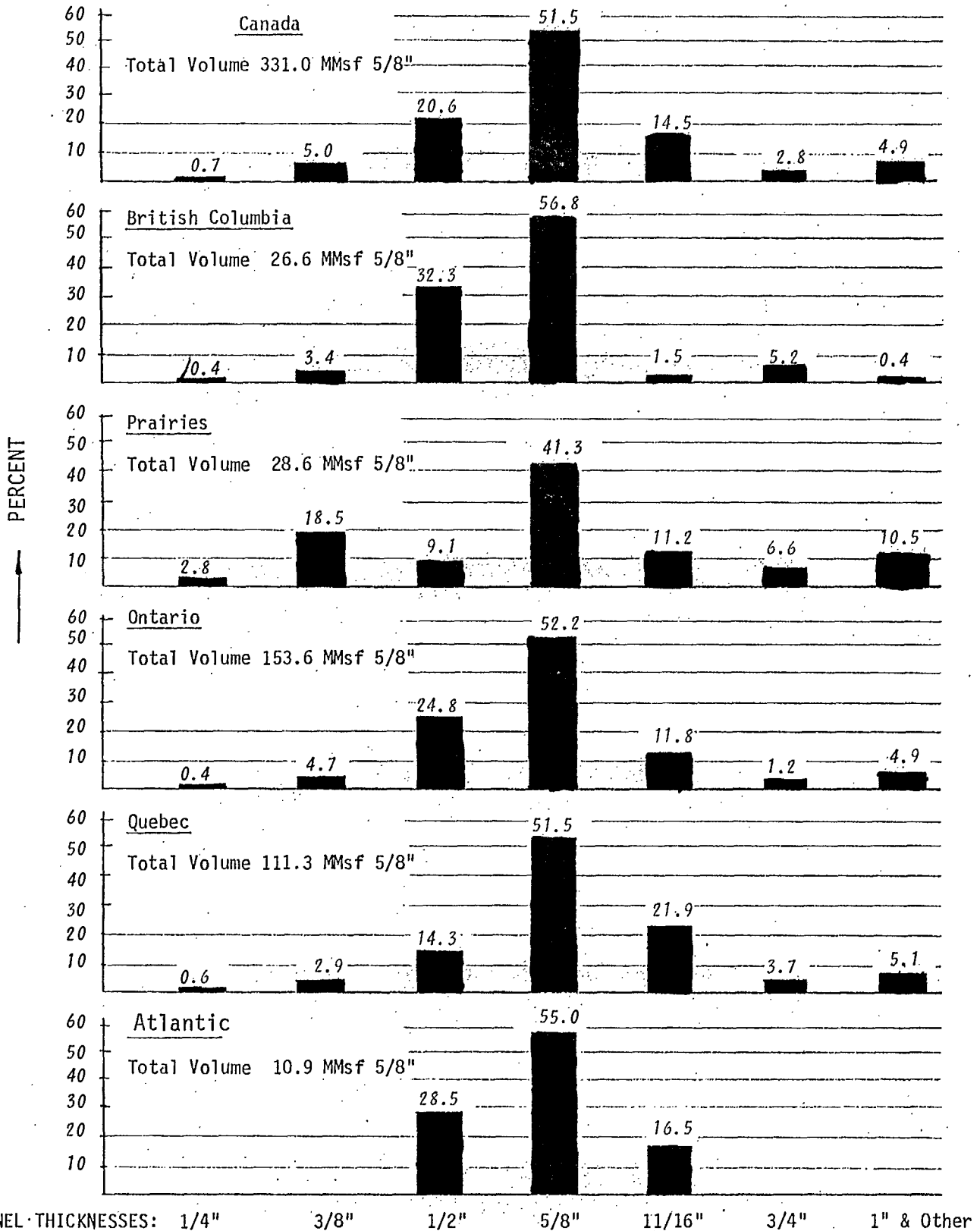
Source: C.E.I. Findings & Estimates

FIGURE II-7 - ALL BOARD FINISHING - PERCENT DISTRIBUTION BY TYPE OF FINISHING & BY APPLICATION



Source: C.E.I. Research

FIGURE II-8 - PROFILE OF THE 1974 CANADIAN CONSUMPTION OF U.F. PARTICLEBOARD BY PANEL THICKNESS AND REGION

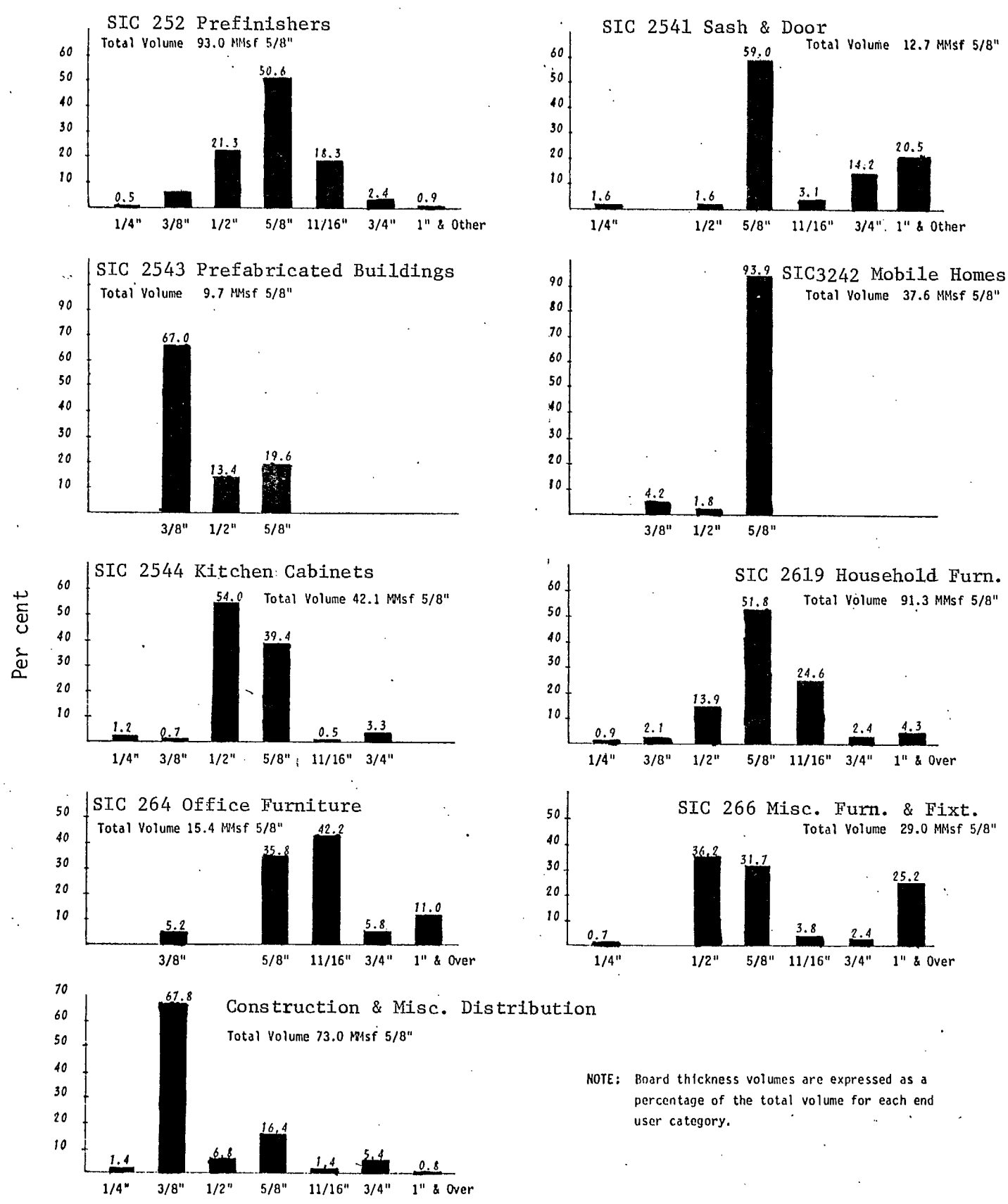


NOTE: Board thickness volumes are expressed as a percentage of the total volume for each region.

*Shown as per cent of total.

SOURCE: C.E.I. Research

FIGURE II-9 - PROFILE OF THE 1974 CANADIAN CONSUMPTION OF U.F. PARTICLEBOARD BY PANEL THICKNESS AND BY END USER (SIC CATEGORY)



NOTE: Board thickness volumes are expressed as a percentage of the total volume for each end user category.

Figure II-11 shows the preferences for panel size and board type by end-user industry. In 1974, about 81 per cent of all particleboard was purchased in 4' x 8' or 49" x 97" panels. Only 2.4 per cent was purchased in cut-to-size form.

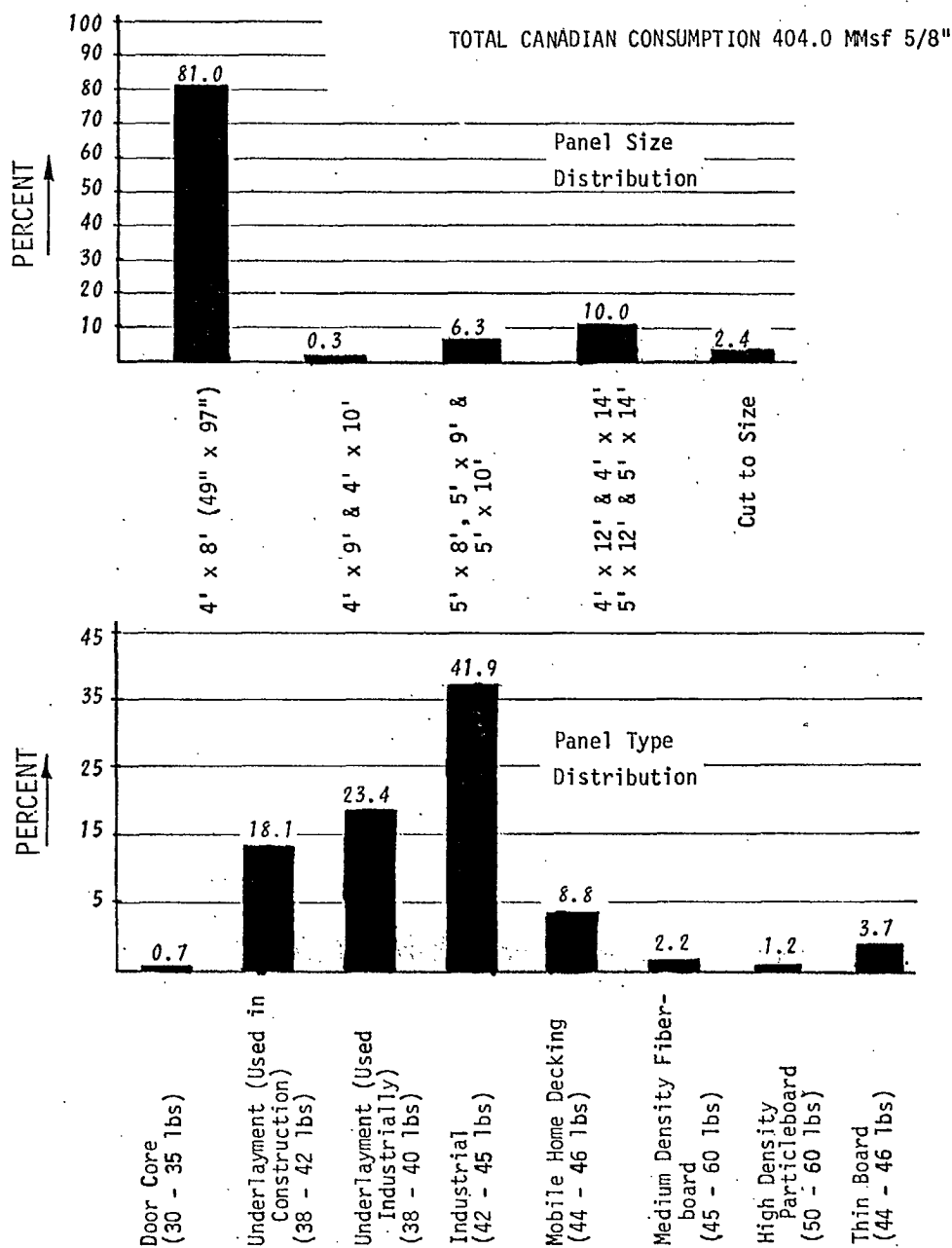
Nearly 42 per cent of all board purchased was in the standard industrial grades and in the density range of 42 to 45 lbs/cu. ft. Significantly 24 per cent of domestic consumption was in underlayment grade in the density range of 38-42 lbs/cu. ft., applied to industrial end-uses.

In regard to distribution and marketing, Columbia Engineering found that nearly all industrial end-users purchased their board either through wholesale distributors or directly from manufacturing plants while the construction sector purchased mainly through retail distribution outlets.

Of the 330 MMsf 5/8" purchased by industrial end-users, Columbia estimates that approximately 40 to 50 per cent is purchased through large wholesale distributors, 15 to 25 per cent from domestic manufacturing plants, 10 to 15 per cent directly from U.S. plants and the rest through small distributors or purchasing groups.

The interviewers noted that certain Canadian end-users were somewhat concerned about the Canadian particleboard industry, particularly the limited volume produced and the continued reliability of domestic supplies. Most users, particularly in Eastern Canada, expressed a preference for Canadian board given equal quality and even a slight price premium, not because of nationalistic feelings but because of proximity of supplies and better service.

FIGURE II-11 - PROFILE OF THE 1974 CANADIAN CONSUMPTION OF U.F. PARTICLEBOARD BY PANEL SIZES, TYPES & DENSITIES



SOURCE: C.E.I. Research

With regard to particleboard pricing, 1974 cannot be considered a typical year. The year started with extremely high prices which dropped to an extremely low level by the third quarter as a result of heavy U.S. imports. The Columbia concludes that U.S. imports will tend to keep Canadian particleboard prices at a relatively low level as long as U.S. demand is well below U.S. plant capacity. Since U.S. plant capacity (including medium density fibreboard and "thin board") is in excess of 5.4 Bsf 3/4" per annum (6.5 Bsf 5/8") compared to an estimated 1975 consumption level of 3.5 Bsf 3/4", this condition is likely to last throughout 1976.

SHORT TERM DEMAND PROJECTION

Columbia estimates that consumption in 1975 should remain at the same level as in 1974, or about 400 MMsf 5/8". While consumption during the first half of 1975 was at a reduced level, all indicators point to increased purchases during the second half of the year. However, Canadian domestic production in 1975 will be approximately 20 per cent higher than the corresponding figure in 1974, or about 230 to 240 MMsf 5/8". Imports may reach an estimated 160 to 170 MMsf 5/8" and exports will be nearly insignificant.

The regional distribution of consumption in 1975 should be similar to 1974 but the distribution by end-using industry will change. The prefinishing sector will use about 15 per cent more raw board than it did in 1974. This is due to the large increase in prefinishing capacity in Canada and the expectation that certain end-user industries will consume a larger volume of pre-finished board. As a result, the consumption of raw board by the furniture industries will decrease slightly.

The projection for 1976 assumes that housing starts will recover by the second quarter of 1976, that activity in the factory built homes (prefabricated and mobile) will continue at a strong level and that the furniture industries will experience a reasonably good, but not an exceptional year. On this basis, Columbia estimates an increase in consumption of approximately 10 to 12 per cent in 1976 or to about 440 to 450 MMsf 5/8".

In 1976, a further strong increase in use by prefinishers is projected due to the rapidly increasing prefinishing capacity throughout most regions of Canada. As a result, in the other end using industries their incremental demand is expected to be satisfied by more prefinished panels and the volume of unfinished board purchases will remain constant.

Particleboard prices should remain close to their present levels throughout 1976, due to the pressure from U.S. imports. Exports may increase only slightly.

The breakdown of the projected consumption in 1975 and 1976 as compared to 1974 is shown in Table III-1.

While domestic production in 1976 will increase substantially over 1974 and 1975 it is not expected to match domestic consumption, partly because the new plants (Domtar, Pluswood) are unlikely to reach their full capacity and partly because the modifications in progress at the Northwood Panelboard Ltd. plant in Chatham, N.B., will, in all probability, not be completed before the summer of 1976. In addition, some Canadian plants are not expected to be competitive with certain grades of U.S. imports. Based on these considerations, and assuming none of the waferboard capacity is diverted to production of U.F. panels, domestic shipments in 1976 will be in the order of 340 to 360 MMsf 5/8", while imports will be about 80 to 100 MMsf 5/8".

TABLE III-1

PROJECTED PARTICLEBOARD CONSUMPTION IN CANADA, 1974 - 1976

Volumes in MMsf 5/8" Basis

SIC	DESCRIPTION	1974	1975	1976
252	Veneer, Plywood and Prefinishers	93.0	110.0	125.0
2541	Sash, Door & Millwork	12.7	11.0	14.0
2543	Prefabricated Homes	9.7	11.0	13.0
3242	Mobile Homes	37.6	37.0	42.0
2544	Kitchen Cabinets	42.1	38.0	40.0
2619	Household Furniture	91.3	82.0	85.0
264	Office Furniture	15.4	15.0	16.0
266	Miscellaneous Furniture	29.2	30.0	30.0
	TOTAL INDUSTRIAL	331.0	334.0	365.0
	TOTAL CONSTRUCTION	73.0	70.0	80.0
	T O T A L	404.0	404.0	445.0

Source: C. E. I. Research

TEN YEAR DEMAND PROJECTION

Columbia has studied the demographic and economic projections which were prepared for the next ten to fifteen year period by the Economic Council of Canada, and other sources. The relevant overall conclusions from these sources are that:

- a substantial increase in Canadian household formations will occur over the next ten years (1965-75: 175,000 units/year, average; 1975-85 225,000 units/year, average)
- despite the somewhat excessive inflationary trends, the disposable income of Canadians is not expected to decline in terms of constant dollars.

Although the validity of the second conclusion given above is open to serious question, for the purpose of this study it is assumed here that Governments will take the necessary measures to safeguard the ability of Canadians to purchase essentials, such as housing.

These expectations should have the following impact on housing and furniture, the two basic industries consuming particleboard:

- housing starts should, at least, average about 220,000 to 230,000 units per annum over the forecast period;
- the rising cost of on-site construction should result in a substantial growth in the factory built housing industries (prefabricated and mobile);
- the large construction projects foreseen in Canada for the next ten years, mostly in relatively remote locations, coupled with promising export opportunities, should also encourage the growth of factory built housing;
- furniture manufacturing should increase at a minimum rate of five to six per cent per annum over the forecast period. The penetration of

particleboard into furniture applications will continue over the next ten years, although at a greatly reduced rate during the last part of the forecast period.

Based on these considerations, Columbia has projected the growth for each end-using industry (SIC category) in Canada for the year 1980 and for the year 1985. The consumption figures and the expected rates of annual growth are given in Table III-2.

During the first five years, from 1976 to 1980, the greatest growth is expected in the prefinishing category. The consumption of raw board by the furniture industries is expected to increase at a lower rate, mainly because of the higher usage of prefinished board by these sectors.

During the second part of the forecast period, the annual compounded rate of growth for total consumption is expected to decline from eleven and one-half to seven per cent, mainly because after 1980, particleboard penetration by particleboard into the presently known end using industries will be close to saturation levels.

The development of new end-use is considered to be a good possibility over the forecast period. If such new end-uses materialize, 1985 consumption levels given in Table III-2 could be exceeded by ten to fifteen per cent.

The regional distribution for 1980 and 1985 is much more difficult to project since it is influenced by other than straight demand factors. Among these are: the location of future particleboard plants, prefinishing operations, end-using industries' locations, and others.

TABLE III-2

PROJECTION OF U.F. PARTICLEBOARD CONSUMPTION IN CANADA, 1976-1985
 Volumes in MMsf 5/8"

SIC	Description	1976	Projected Annual Growth Rate (compounded)	1980	Projected Annual Growth Rate (compounded)	1985
252	Veneer, Plywood and Prefinishers	125	15.2%	220	8.1%	325
2541	Sash, Door and Millwork	14	10.6%	21	10.7%	35
2543	Prefabricated Homes	13	11.4%	20	16.0%	42
3242	Mobile Homes	42	11.5%	65	9.0%	100
2544	Kitchen Cabinets	40	8.3%	55	7.0%	77
2619	Household Furniture	85	8.5%	118	6.9%	165
264	Office Furniture	16	9.5%	23	6.8%	32
266	Miscellaneous Furniture	30	7.5%	40	7.0%	55
	TOTAL INDUSTRIAL	365	11.4%	562	8.2%	832
	TOTAL CONSTRUCTION	80	11.8%	125	6.3%	170
	T O T A L	445	11.5%	687	7.0%	1002

Source: C. E. I. Research

Columbia estimates that industrial consumption in the West should increase at the expense of the eastern Provinces, due to the expected increase in western population, mainly in British Columbia. On the other hand, the growth of particleboard in the construction end-use should be greater in the East, especially in Ontario (population increase plus greater room for penetration), than in the West over the next ten years. As a result, the East's share in this end-use, in terms of a percentage of the total, should increase at the expense of the West.

On the whole, the western Provinces' (B.C. and the Prairies) share of total consumption is expected to increase from about twenty-two per cent in 1974 to nearly twenty-five per cent in 1985, whereas Ontario and Quebec are expected to drop from about seventy-five to seventy per cent.

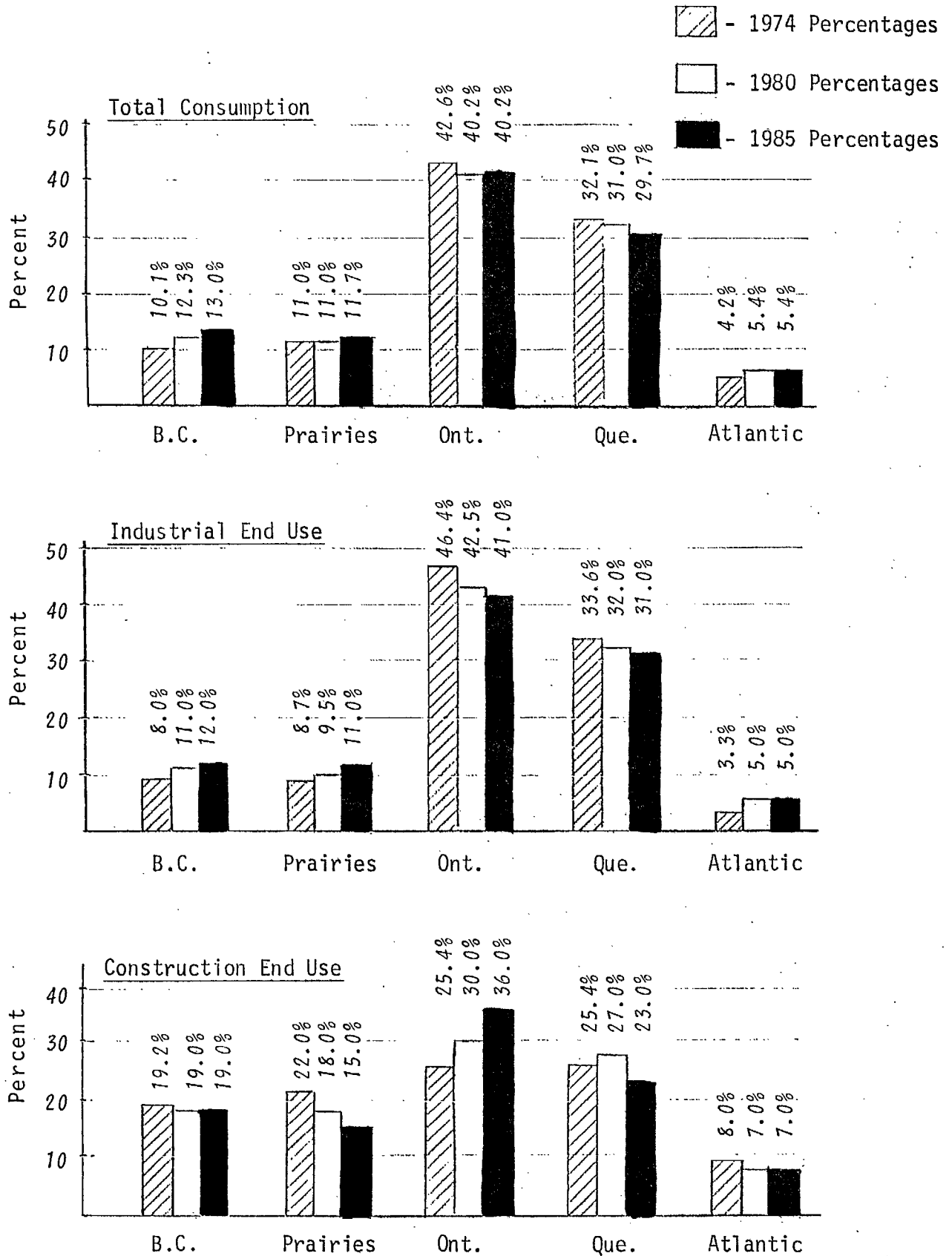
The Atlantic Provinces' share is expected to remain relatively stable. The industrial end-use in this region is expected to be mainly in the pre-finishing sector. The use of particleboard in construction activities in this region is likely to be encouraged by the presence of its two particleboard plants which are large relative to regional demand.

The projected regional distributions for 1980 and 1985 in comparison with the distribution of 1974 are shown in Figure III-5.

SUPPLY vs. DEMAND - 1980 to 1985

No new Canadian plant construction is expected to be initiated before the end of 1975. As a result, new capacity is not likely to make a significant impact on the 1977 domestic production. In 1977 therefore, supply and demand should be nearly balanced.

Figure III-5
 PROJECTED REGIONAL DISTRIBUTION 1980 - 1985
 COMPARED TO 1974



To meet the projected 1980 domestic demand of 687 MMsf 5/8", one new plant with a capacity of about 80 to 100 MMsf 5/8" will be required, assuming the continued operation of all presently operating plants.

Between 1980 and 1985, about 300 MMsf 5/8" of new capacity will have to be installed if the projected domestic demand is to be supplied from domestic sources.

EXPORT MARKETS

United States

Leonard Guss and Associates of Tacoma, Washington have prepared an overview of the U.S. markets for this study. Guss and Associates (LGA) projects U.S. particleboard demand by 1985 at about 8.4 Bsf 3/4" or 10.1 Bsf 5/8", excluding structural boards such as waferboard.

About forty percent of this demand will be located in the north-central and north-eastern regions of the United States (see Figure 8, reproduced from appendix C). The same regions are expected to produce no more than 800 MMsf 3/4" board by the year 1985. The particleboard supply to this region came traditionally, and may continue to come, from the West Coast of the United States. However, against the West Coast manufacturers, a Canadian plant located in Ontario or Quebec has, at present, an average freight advantage of \$29.75/Msf 3/4" or \$24.80/Msf 5/8". From selected Eastern Canadian locations to selected destinations, this freight advantage could be (and is at the present) about twenty to twenty-five per cent higher. As freight rates are expected to rise over the next ten year period, this freight advantage is likely to increase in favour of the eastern

Canadian plant and is likely to be in the order of \$15 to \$18/Msf 5/8", even after duty charges. In addition, the opportunity to ship by truck from eastern Canada in competition with rail shipments from the West Coast has a further advantage.

Based on the above considerations, it is not unreasonable to expect that eastern Canadian plants could capture twenty-five per cent of the projected market in the north-central and north-eastern regions of the U.S., or a volume of about 1 Bsf 5/8" per annum -- about equal to the total demand projected for Canada by 1985. This is considered to be a real export opportunity for eastern Canadian plants, provided they can be cost competitive in all respects with the existing and yet-to-be constructed U.S. West Coast manufacturing units.

Europe and Japan

A general overview of export opportunities in Europe and Japan was also completed.

European consumption is expected to increase by about 15 Bsf 5/8" over the next 15 year period. Demand in Japan is projected to increase by 1.3 Bsf 5/8". These figures are based on the revised F.A.O. projections which have been greatly reduced from estimates made earlier.

The F.A.O. figures also indicate that neither Europe nor Japan has the indigenous forest resources to supply this projected growth in demand.

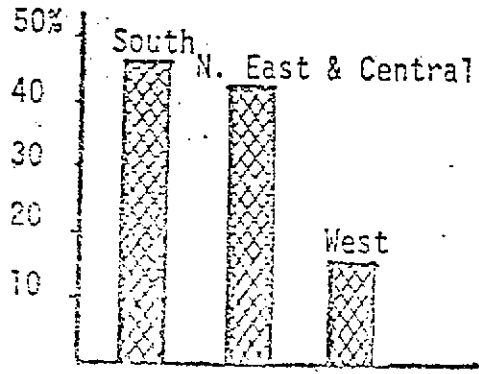
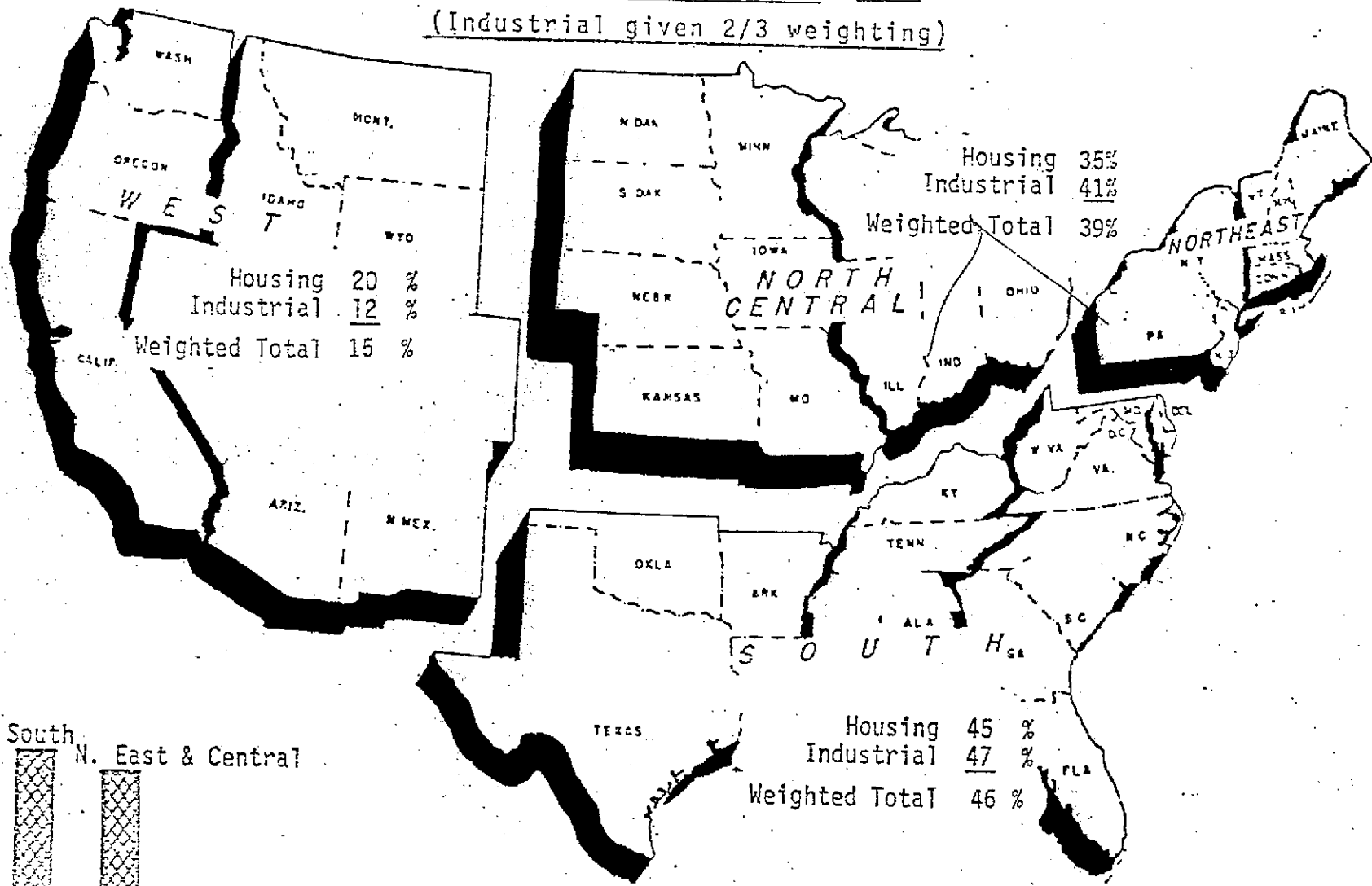
The European demand could be supplied partly from eastern Europe and partly from the U.S.S.R. These countries, however, have a demand of their own and are not likely to be able to supply all the requirements. Some of the demand is expected to be met by the production of board in the Third World

FIGURE 8 - Distribution OF UNITED STATES PARTICLEBOARD CONSUMPTION

(FROM APPENDIX B)

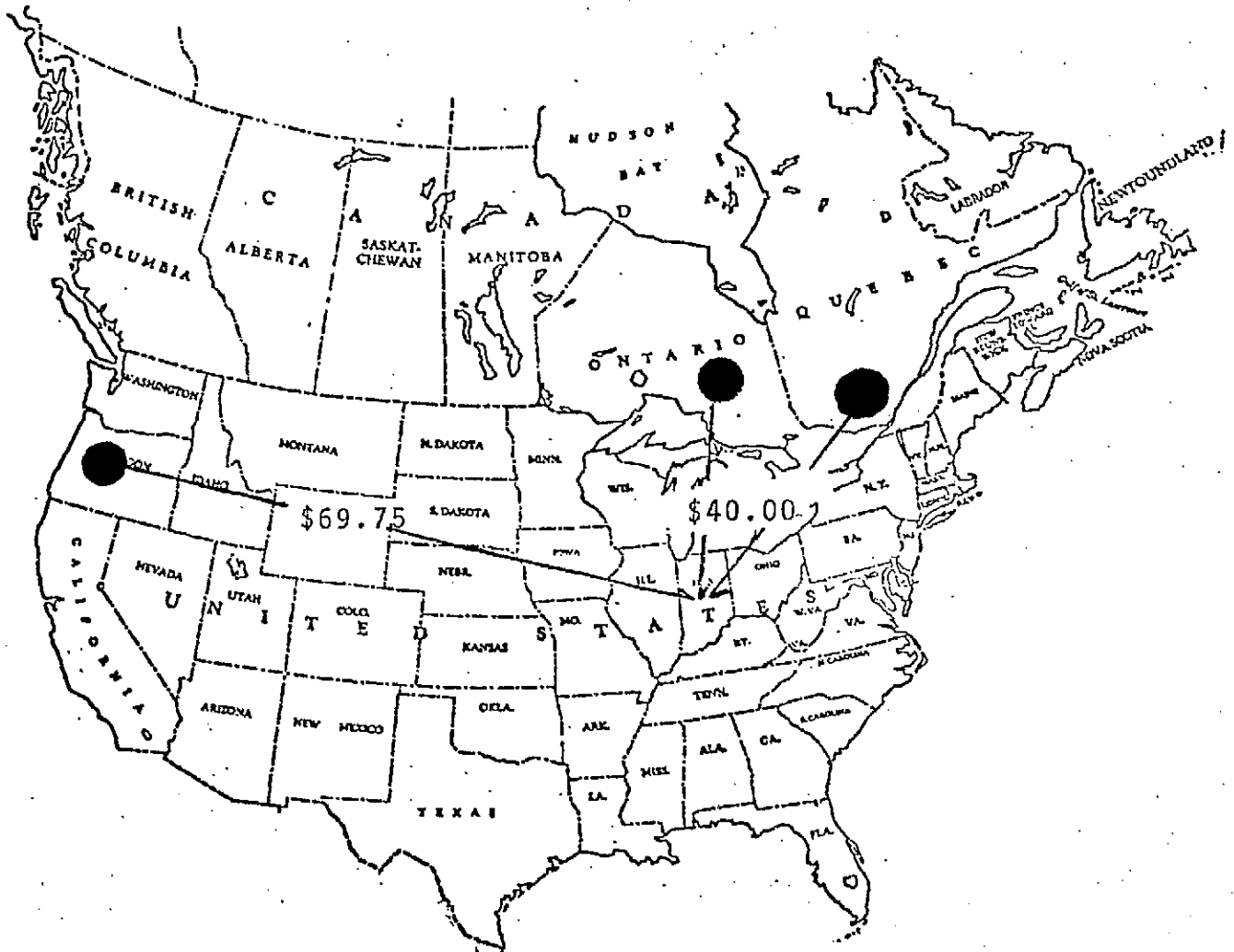
BY MAJOR REGION - 1985

(Industrial given 2/3 weighting)



Source: LCA Estimates

ESTIMATED FREIGHT COST COMPARISON TO SELECTED U.S. MARKETS FROM EASTERN CANADA
AND U.S. WESTERN PARTICLEBOARD PLANTS



Comparative freight rates in dollars/M
 sq. ft. 3/4", 45 lb/ft 3

Summer 1975

Freight Advantage \$29.75/M sq. ft. 3/4"
 \$24.80/M sq. ft. 5/8"

SOURCE: LGA Estimates

countries, mainly Africa.

The Japanese demand is likely to be supplied from eastern Russia and from South-east Asia.

Canada would appear to have real export opportunities in both areas, assuming favourable currency relationships as well as suitable ocean freight and duty arrangements.

OPPORTUNITIES FOR THE CANADIAN PARTICLEBOARD INDUSTRY

The findings of the study indicate that there is considerable scope for expansion in the Canadian particleboard manufacturing industry, provided it becomes fully cost-competitive with United States and other world producers. Cost-competitiveness is an essential criterion for maintaining or achieving a favourable competitive position in the domestic market. This point should be considered in the planning of any new Canadian particleboard installation in order to avoid vulnerability from U.S. imports in domestic markets.

From the point of view of national strategy, two basic options are available:

1. Continue to rely on the relatively low cost U.S. imports to supply a large part of the Canadian raw board demand and concentrate on the upgrading of particleboard, both in terms of prefinishing and other secondary manufacturing operations (furniture, mobile homes etc.).

Prefinishing and secondary manufacturing are less capital intensive and more labour intensive than the basic particleboard manufacturing operation. Therefore, if maximum job creation and value added

(other than capital value) at a minimum of capital requirement are deemed to be desirable, this type of strategy may make economic and social sense.

The disadvantage would appear to be a rather insecure supply situation for the Canadian secondary end using industries should U.S. plant capacity fall behind U.S. domestic demand. It could also mean the under-utilization of the Canadian forest resource, especially continued wasting of the non-chippable softwood sawmill residues.

2. Encourage the construction of world and/or U.S. market scale plants with strong export orientation.

The raw material conditions are favourable in most of the Canadian regions. There is an abundance of sawmill residues in Canada, largely wasted at the present. The bulk of these residues are in species favourable for and desired by particleboard manufacturers, namely spruce and pine. The growing spruce lumber industries in eastern Canada should provide an especially favourable raw material in adequate concentrations to manufacture high grade particleboards, in world-scale, fully cost-competitive plants for both the domestic and the north-central and eastern U.S. markets and, possibly, for Europe.

Opportunities would also appear to exist in selected locations of B.C. and the Prairies (subject to certain criteria) for the supply of the western domestic markets, the U.S. Midwest, and for some B.C. locations possibly, exports to Japan.

The implementation of an export oriented (mainly to the United States)

Canadian particleboard manufacturing industry could mean that domestic board price levels would eventually be lower in Canada than in the U.S. This, in turn would improve the export competitive position of the Canadian furniture and other secondary end using industries. However, it could endanger the financial stability of some of the existing Canadian particleboard plants. Some of these plants could, however, be expanded while others could maintain profitability by increased prefinishing.

In Columbia's judgment, the basic criteria for the establishment of cost competitive particleboard plants in Canada are capacities in the order of 100 MMsf.5/8" per annum or larger and low wood cost. The establishment and future success of competitively scaled plants requires an adequate concentration of low cost raw materials, a relatively high capital investment and an aggressive marketing strategy.

Only a small portion of the residues generated by Canadian sawmills are utilized at the present. The cost of such residues should, therefore, remain at a relatively low level for some time to come. There are, however, other possible or even probable future demands on this raw material for pulp and fuel.

It may be concluded, therefore, that the desirability and, indeed, the feasibility of implementing an export oriented Canadian particleboard manufacturing industry will depend on a careful evaluation of the relative overall economic and social benefits which may accrue from the allocation of the available sawmill residue as raw material for particleboard in contrast to its use as pulp furnish or fuel end-uses.

