

# RESEARCH REPORT



Appropriate Methodology to Undertake a  
Structural Analysis of the Canadian and  
International Manufactured Housing Industry



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**Appropriate Methodology  
to Undertake a Structural Analysis  
of the Canadian and International  
Manufactured Housing Industry**

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## Executive Summary

Although manufactured housing accounts for about 10% of the Canadian single family housing market, in the United States it has captured approximately 60% of the market (> 200,000 units annually). This large differential in market share of manufactured housing in the two countries has posed both an opportunity and a threat to Canadian manufacturers that is accentuated with the Canada\U.S. trade agreement. To authenticate that sufficient industry data exists, and is accessible, CMHC requested that a methodological evaluation be undertaken prior to the initiation of a comprehensive statistical study of the international competitiveness of the Canadian manufactured housing industry.

The statistics compiled for this preliminary report reveal that the structure of the North American manufactured housing market has altered in the past four years. The competitive situation in the mobile home market segment is different than that of stationary (prefabricated) manufactured housing. As well, the modular market segment has withstood the impact of the recession much better than the pre-cut manufacturers. The data reveals some important Canadian industry trends:

- Although overall industry output has declined during the recession, the decline has been in only one of the three industry segments, pre-cut stationary units.
- The modular and mobile home market segments have increased dramatically despite the recession.
- The stationary market experienced an especially severe (33%) decline in 1992.

The research undertaken in this preliminary statistical investigation demonstrates that the methodology proposed for the main study is appropriate for the three major manufactured housing industry segments. For some building products, and the disaggregation of pre-cut and modular units, Canadian production data may involve up to a two-year lag. For pre-cut and modular, Statistics Canada Annual Survey of Manufacturers and industry data can be used to create a disaggregated estimate. This methodology cannot be utilized for log homes and post and beam construction. To obtain statistical data on log and post and beam production CMHI could undertake a survey of Canadian manufacturers. The methodology proposed for manufactured housing could also be utilized to assess the comparative Canadian/U.S. markets for many categories of, and some specific, building products.

The proposed research study should be oriented towards first producing a comparative industry survey report on the Canadian and U.S. manufactured housing markets. The results would be widely circulated in the industry through a mailing to all Canadian manufacturers listed in Statistics Canada data base, provincial ministries of housing and industry as well as concerned federal departments and agencies. The major international markets for manufactured housing are North America, Japan, and the EEC. Central and eastern Europe may well become a major market for Canadian housing and housing technology. Manufactured housing has captured 60% of the U.S. market, 20% of the Japanese market and as much as 90% of some European markets..

## Résumé

Bien que l'habitation usinée représente approximativement 10 p. 100 du marché des maisons individuelles au Canada, ce type d'habitation s'est emparé d'environ 60 p. 100 du marché américain (plus de 200 000 logements par année). Cet écart important entre les marchés des deux pays a présenté aux fabricants canadiens à la fois des perspectives intéressantes et une menace accentuée par l'accord commercial canado-américain. Pour confirmer l'existence d'une quantité suffisante de données sur cette industrie, la SCHL a demandé qu'une évaluation méthodologique soit entreprise avant le début de l'étude statistique globale du caractère concurrentiel du marché canadien de la maison usinée sur le plan international.

Les statistiques recueillies pour ce premier rapport révèlent que la structure du marché nord-américain de l'habitation usinée s'est modifiée au cours des quatre dernières années. La concurrence qui s'exerce dans le secteur de la maison mobile est différente de celle du secteur de la maison prête à assembler sur place. De plus, le secteur de la maison modulaire a beaucoup mieux résisté aux conséquences de la récession que le secteur des maisons prêtes à assembler. Les données révèlent certaines tendances importantes dans l'industrie canadienne :

- . Bien que toute l'industrie ait souffert au cours de la récession, la baisse ne s'est produite que dans un des trois secteurs de l'industrie, soit les logements prêts à assembler sur place.
- . Les secteurs de la maison modulaire et de la maison mobile ont connu une hausse marquée malgré la récession.
- . Le secteur des habitations réalisées sur le chantier a pour sa part connu une baisse particulièrement importante en 1992.

Les recherches entreprises dans le cadre de cette première étude statistique montrent que les méthodes proposées pour l'étude principale conviennent aux trois grands secteurs de l'industrie de l'habitation usinée. En ce qui a trait à certains matériaux de construction et à la décomposition des marchés des logements prêts à assembler et modulaires, les données sur la production canadienne accusent dans certains cas un retard de deux ans. Pour ces types d'habitation, les données de l'enquête annuelle menée par Statistique Canada auprès des fabricants et les données de l'industrie peuvent servir à établir une estimation détaillée. Cette méthode ne peut être utilisée pour les maisons en pièce sur pièce et les constructions à poteaux et à poutres. Pour obtenir des données statistiques sur la production de ces deux types d'habitation, l'Institut canadien de l'habitation usinée devra mener une enquête auprès des fabricants canadiens. La méthode proposée pour les maisons usinées pourrait également servir à évaluer de nombreuses catégories de matériaux de construction et certains matériaux en particulier sur les marchés canadien et américain.

L'étude proposée devrait d'abord être orientée vers la rédaction d'un rapport sur une enquête comparative de l'industrie portant sur le marché de l'habitation usinée du Canada et

des États-Unis. Les résultats seraient communiqués à grande échelle par la poste, dans l'industrie, à tous les fabricants dont le nom figure dans la base de données de Statistique Canada, aux ministères provinciaux de l'habitation et de l'industrie ainsi qu'aux ministères et aux organismes fédéraux pertinents. Les marchés internationaux principaux pour la maison usinée sont l'Amérique du Nord, le Japon et la CEE. L'Europe centrale et orientale pourraient bien devenir des marchés importants pour les habitations canadiennes et la technologie qui s'y rapporte. La maison usinée a conquis 60 p. 100 du marché américain, 20 p. 100 du marché japonais et jusqu'à 90 p. 100 de certains marchés européens.

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## **SECTION 1: INTRODUCTION**

### **1.1 Purpose**

This methodology research has been initiated by the Canadian Manufactured Housing Institute (CMHI) and supported by Central Mortgage and Housing Corporation (CMHC). The objective of the contractors assignment was not to undertake the proposed study but to assess and demonstrate if sufficient data is available to undertake a comparative analysis of the industry.

The manufacturing housing industry incorporates many separate and distinct products that are orientated to different market segments. They include prefabricated panels, mobile homes, post and beam, modular (sectional) house components, log homes and pre-engineered (pre-cut) buildings. Production and trade data have not been published in a consistent manner according to product type. As a result, Canadian manufacturers have not had the benefit of data published in a manner that would allow them to be fully knowledgeable of competitive market trends in Canada and abroad; and policy makers have not had comprehensive industry data to assess the competitiveness of the various market segments.

To identify those market segments that are experiencing declines or growth, in both domestic and international markets, statistics by market segment must be available. To authenticate that sufficient industry data exists, and is accessible, to be able to analyze the competitiveness of the Canadian manufactured housing industry, CMHC requested that a methodological evaluation be undertaken prior to the initiation of a comprehensive statistical study of the international competitiveness of the Canadian manufactured housing industry.

### **1.2 Importance of the Industry**

In the late 1980's, manufactured housing increased its market share in Canada and experienced growth rates greatly in excess of the overall housing market. Total output by the end of the decade peaked at \$600 million with a value-added component of 55%, employing over 4000 Canadians prior to declining in the following three years as a result of the recession. Although manufactured housing accounts for about 10% of the Canadian market, in the United States it has captured well over 60% of the market (>200,000 units annually). This large differential in market share of

manufactured housing in the two countries has posed both an opportunity and a threat to Canadian manufacturers that is accentuated with the Canada\U.S. trade agreement.

### **1.3 International Competitiveness**

A recent study by Clayton Research, on the manufactured housing industry in Ontario, identified U.S. imports as a new competitive aspect in the Canadian marketplace in stationary manufactured housing. It is generally considered that Canadian manufactured housing is of superior quality but more costly than the U.S. product. To date, the nature and extent of U.S. competition have not been statistically assessed. The U.S. statistical information obtained for Section 4 of this report substantiate the industry opinion that Canada\U.S. industry competitiveness has been far from static in recent years.

Prior to 1989 Canadian imports of prefabricated buildings of wood were not significant, totalling approximately \$1 million annually. In 1990 the level rose to \$13 million. The recession in the housing market of 1991 and 1992 resulted in a major decline in manufactured housing imports in Canada. With the significant growth in the Canadian manufactured housing market in 1993 (15%) and the probable effects of the Canada\U.S. Free Trade agreement, imports could become a competitive threat.

The statistics compiled for this preliminary report reveal that the structure of the North American manufactured housing market has altered in the past four years. The Mobile Home market segment example that is addressed in Section 4 illustrates the importance of market disaggregation that is the underlying rationale of the main study proposal. The competitive situation in the mobile home market segment is different than that of stationary(prefabricated) manufactured housing.<sup>1</sup> As well, the modular market segment has withstood the impact of the recession much better than the pre-cut manufacturers.

Canada exports a very low percentage of manufactured housing (5%) despite the proximity to the U.S. market that is dominated by manufactured housing. There is a view that Canada could substantially increase its exports of manufactured housing. The Canadian manufactured housing industry and its supportive stakeholders need to develop a comprehensive strategic plan that will target the most significant market opportunities. To do this, the growth segments of the industry, both domestically and internationally must be identified in order to assist the Canadian industry and other

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<sup>1</sup>Pre-cut, modular and vacation homes are classified as "stationary" manufactured housing in U.S. statistical reporting.

stakeholders in assessing the opportunities and threats to the industry. This report attempts to illustrate the type of statistical analysis that can help identify the comparative growth segments of the markets of the two countries.

#### **1.4 Outline of the Report**

This report is organized according to the tasks specified in the CMHC Terms of Reference for the study, specifically;

##### **Section 2. Disaggregated Statistics**

**Task:** Ascertain if the Statistics Canada data can be disaggregated to the eight digit S.I.C. codes. Prepare a sample analysis for one of the manufactured housing products.

##### **Section 3. Reliability of Statistics**

**Task:** Test the reliability of the Statistics Canada data against industry information provided by provincial and national associations and other sources that collect data on the industry.

##### **Section 4 United States Statistics**

**Task:** Investigate sources for similar data in the United States. Undertake a sample analysis and test the reliability of data, as feasible, against other industry data.

##### **Section 5. A Building Product Example - Windows**

**Task:** Investigate whether this method could be used for analyzing sales and trade data for selected building products used in residential construction.

##### **Section 6. Alternative Approaches and Recommendations**

**Task:** Suggest alternate approaches to achieve the objective of the proposed larger study, if the above method is not deemed workable and/or if other approaches may be less costly.

## Section 7. Outline of Work

**Task:** Prepare an outline of work that would have to be performed to collate available data into a form suitable to perform a statistical analysis.

### 1.5 Examples of Data Availability

Examples of available Canadian import and export data for the sectors specified in the terms of reference have been prepared in a tabular format as well as examples of United States data availability. Because of their volume they have not been included in this report but are available as an appendix.

## SECTION 2. DISAGGREGATED STATISTICS

**Task:** *Ascertain if the Statistics Canada data can be disaggregated to the eight digit S.I.C. codes. Prepare a sample analysis for one of the manufactured housing products.*

### 2.1 Availability of Data

#### 2.1.1 Product Codes

Since 1988 Statistics Canada publishes data according to the standard classification of goods (SCG), an extension of the Harmonized Commodity Description and Coding System (HS) at a six or eight digit level depending upon the commodity. This system is cross referenced to the six digit Standard Industrial Classification Codes (SIC) but data is now reported according to HS system classifications<sup>2</sup>. The following Table 2.1 cross references the Statistics Canada data collection and reporting on manufacturing housing output by product type.

Table 2.1 illustrates that Statistics Canada report on domestic manufacturing housing output in two separate categories, three product groupings and six product classifications. Mobile homes data are primarily classified as "Transportation" under HS 8716.10.<sup>3</sup> The remainder of manufactured housing is reported within other classifications of "Wood Industries" (25) as HS 9406.05 as "Buildings, prefabricated, of wood".<sup>4 5</sup>

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<sup>2</sup>General international adoption of the HS standard has enhanced the international comparability of data relating to imports and exports. Domestic production reporting has not been standardized on similar HS or SIC codes.

<sup>3</sup>The majority of mobile homes are reported in this classification. A small amount is also classified and reported under HS 9406.00..01(mobile homes, single width). This should be corrected and Statistics Canada concur that this anomaly should be addressed.

<sup>4</sup>We have made the assumption that prefabricated buildings of aluminum (HS 9460.00.69) and steel (HS 9460.00.70) are not relevant to the domestic manufactured housing industry as defined as single dwelling residences. Some low rise multi-dwelling construction utilizes steel and aluminum prefabrication but Statistics Canada does not collect separate data on this market for residential housing. We will attempt to identify the amount of output of metal manufactured buildings are utilized in the housing industry in the main study.

<sup>5</sup>We have also not included solariums (HS 9406.00.64) in the manufactured housing figures utilized in this report; although we are of the opinion that consideration should be given to including solariums in a subsequent main study.

**Table 2.1**  
**STATISTICS CANADA MANUFACTURED HOUSING CLASSIFICATIONS**

<b>HS CLASSIFICATION</b>	<b>DESCRIPTION</b>	<b>PRODUCT</b>
8716.10	Mobile Homes	Mobile Homes
9406.00.1	Mobile Homes single width	Mobile Homes
9406.00.5	Buildings, prefabricated, of wood	All, including commercial & schools
9406.00.51	Component house packages	Pre-cut; log homes
9406.00.52	Buildings, prefabricated, of wood, sectional houses, inc. single complete units	Modular
9406.00.53	Vacation Homes	modular, pre-cut, log
9406.00.53	not specified (n.e.s.)	post & beam, log

### 2.1.2 Domestic Production

We have compiled (aggregated) Statistics Canada domestic data for the housing industry product categories and constructed the following tables.<sup>6</sup> We believe that they provide an accurate statistical description of the industry; it is the first time that industry data has been thoroughly aggregated. One useful benefit to the industry of this preliminary investigation is, from the data collected, we have been able to put together a five year (1987-1992) statistical profile of domestic production that is presented in Table 2.2.

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<sup>6</sup>Based upon the census counts for 1988, 1989 and 1990; on the Survey of Manufacturing estimates for 1991 and 1992.

The data reveals some important industry trends.

- **Although overall industry output has declined during the recession, the decline has been in only one of the three industry segments, pre-cut stationary units.**
- **The modular and mobile home market segments have increased dramatically despite the recession.<sup>7</sup>**
- **The stationary market experienced an especially severe (33%) decline in 1992**

**Table 2.2**  
**CANADIAN MANUFACTURED HOUSING SHIPMENTS**  
**(\$millions)**

<b>Product</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>
<b>Mobile Homes</b>	<b>118</b>	<b>174</b>	<b>172</b>	<b>169</b>	<b>194</b>
<b>Prefabricated</b>	<b>341</b>	<b>387</b>	<b>337</b>	<b>339</b>	<b>229</b>
<b>Pre-cut</b>	<b>173</b>	<b>143</b>	<b>118</b>		
<b>Modular</b>	<b>117</b>	<b>158</b>	<b>156</b>		
<b>Vacation</b>	<b>13</b>	<b>18</b>	<b>13</b>		
<b>Not specified</b>	<b>38</b>	<b>68</b>	<b>29</b>		
<b>Small Producers</b>	<b>37</b>	<b>47</b>	<b>21</b>		
<b>TOTAL</b>	<b>459</b>	<b>561</b>	<b>509</b>	<b>508</b>	<b>423</b>

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<sup>7</sup>These trends are also evident in the United States market structure which is presented in Table 4.1. A relative comparison of the two Canada\U.S.market structures requires the use of housing industry data which is not within the scope of this preliminary data investigation.

**Table 2.3**  
**CANADIAN MANUFACTURED HOUSING**  
**NUMBER OF PRODUCERS**

<b>Product</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>
<b>Mobile Homes</b>	<b>24</b>	<b>26</b>	<b>30</b>
<b>Prefabricated</b>	<b>99</b>	<b>105</b>	<b>93</b>
<b>Pre-cut</b>	<b>25</b>	<b>26</b>	<b>30</b>
<b>Modular</b>	<b>13</b>	<b>17</b>	<b>18</b>
<b>Vacation</b>	<b>6</b>	<b>8</b>	<b>5</b>
<b>Not specified &amp; small producers</b>	<b>55</b>	<b>64</b>	<b>40</b>
<b>TOTAL</b>	<b>129</b>	<b>136</b>	<b>128</b>

Published data from census count is available from Statistics Canada with a one and half year lag, e.g., only 1990 data is now available.<sup>8</sup> For the most recent two years data is available from the Survey of Manufacturers that provides an estimate of monthly production based upon a survey of manufacturers.

The monthly Survey of Manufacturers is not undertaken for prefabricated buildings of wood at a disaggregated level. This prevents undertaking a separate analysis for the most recent year of pre-cut, mobile and vacation homes. A disaggregated product estimate can be generated by utilizing industry data. The Survey of Manufacturers data could be adjusted by deducting the historical market share of prefabricated buildings of wood; commercial and schools to generate a housing industry figure. Utilizing CMHI and the Manufacturing Housing Association of Canada (MHAC) monthly quantity output and average price data, the housing figure can be disaggregated on an estimated basis for pre-cut, modular and vacation homes.<sup>9</sup> This is the methodology that would be employed to disaggregate years 1991 and 1992 of Table 2.2 Industry Statistics. The actual disaggregated figures for 1992 will be available by mid 1994 from Statistics Canada.

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<sup>8</sup>The census was not undertaken for 1991.

<sup>9</sup>Although manufacturers consider commercial and school buildings to be in their industry their data has been omitted to generate a housing industry only total.

### 2.1.2 Trade Data

Comparing trade data along with national product production estimates, over a time series, would reveal the growth and competitiveness of market segments.

Comprehensive trade data is available with a two-month lag. We have compiled trade data for the two main market segments, mobile homes and prefabricated buildings as well as for wood windows as a building products example. Statistics Canada does not disaggregate this data for prefabricated buildings. The World Trade Statistics data base does disaggregate U.S trade data by type of product. From this data Canadian imports from and exports to the U.S., by product category, can be disaggregated. The World Trade Statistics data were used for the disaggregation.

Table 2.4 shows that Canadian manufactured housing exports to the U.S. have remained relatively constant and imports have decreased over the past three years. Although the severe recession in the Canadian domestic industry that Table 2.1 reflects may have affected Canadian imports, the international competitiveness of the Canadian industry over the last three years has not deteriorated. Canada\ U.S. trade represents only 3 to 4% of the Canadian market and an insignificant part of the U.S. market.

**Table 2.4**  
**CANADA\U.S. MANUFACTURED HOUSING**  
**EXPORTS AND IMPORTS**  
(\$millions)

YEAR	PREFABRICATED		MOBILE		TOTAL	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
1989	16.0	3.9 <sup>10</sup>	2.6	18.3	18.6	20.6
1990	9.4	13.2	5.8	14.3	23.7	27.5
1991	6.4	7.5	6.7	5.3	13.1	12.7
1992	7.2	5.5	11.0	4.3	18.2	9.8
Three Year % Change	-55 %	+41 %	+423 %	-77 %	-2 %	-52 %

<sup>10</sup>This number is suspect due to the change in data reporting procedures in 1989.

## **2.2 Conclusion**

### **2.2.1 Domestic Production**

The Canadian manufacturing housing industry production data can be aggregated on an industry basis and disaggregated into four product types from existing Statistics Canada data. Disaggregation can be done for mobile homes, modular units, pre-cut and vacation homes with a two-year lag. The industry can be disaggregated into two product categories, mobile homes and pre-cut/modular, on a current (two month lag) basis.

Two product types, log homes and post and beam, cannot be disaggregated from Statistics Canada data. The North American Log Home Information Center periodically publishes data on the U.S., Canadian and Japanese markets. In 1988 the 68 Canadian producers shipped 1501 units, 10% of North American production. Of the Canadian production, 25% was exported to the U.S. and 7% to Japan. Since the number of producers is relatively small, an industry association survey methodology could provide product data at an economical cost.

### **2.2.2 Trade Data**

If trade data were correlated with the five year production data the relative competitiveness of the mobile, pre-cut and modular manufactured housing market segments could be assessed. To undertake a similar analysis for the three stationary product sectors; pre-cut, modular and vacation homes depends upon the ability and/or willingness of Statistics Canada to disaggregate their data.

**Since most Canadian manufacturers specialize in only one of the three product classifications and at most two of the product types, analyzing and publishing data according to market segments would be a positive addition to their body of market information.**

## **2.3 Example: Disaggregation, Mobile Homes**

### **2.3.1 Canada**

Table 2.5 was compiled from Statistics Canada Data to illustrate that data is available to undertake a separate product type analysis. Unit volume data for the past year has been estimated based upon industry data that is already being collected by CMHI. Trade data is available on a current (two month lag) basis.

**Table 2.5**  
**MOBILE HOMES**  
**CANADIAN INDUSTRY SHIPMENTS**  
(\$millions)

YEAR	Single Width	Double Width	Not Specified	TOTAL \$ Shipments	Annual Growth Rate
1988	\$87	\$26	\$5	\$118	
1989	\$113	\$57	\$4	\$174	47%
1990	\$137	\$31	\$4	\$172	-1%
1991			\$5	\$169	-1%
1992			\$5	\$194	15%
		NUMBER	OF	PRODUCERS	
1988	10	9	5	24	
1989	12	11	3	26	8%
1990	16	11	3	30	15%
		UNITS PRODUCED			
1988	3335	1066	148	4549	
1989	3718	1981	140	5839	28%
1990	4340	861	120	5321	-9%
1991				4372 <sup>11</sup>	
1992				4490	

<sup>11</sup>Statistics Canada did not undertake a census in 1991 and the data for 1992 is not yet available. We have estimated the 1991 and 1992 unit numbers using CMHI data. In 1991 and 1992 the Alberta classifications were altered in a manner that results in approximately 675 units reported as modular rather than mobile.

### 2.3.2 United States

United States data is available with a one year lag. The Bureau of Census does not collect the data by single versus double width. The contractor was too parsimonious to pay the user fee to collect all the data required to construct a table similar to Table 2.4 for the U.S. industry. Table 4.1 provides 1987-1991 U.S. value of shipments statistics.

### SECTION 3. RELIABILITY OF STATISTICS

*Task: Test the reliability of the Statistics Canada data against industry information provided by provincial and national associations and other sources that collect data on the industry.*

#### 3.1 Survey of Manufacturers

Statistics Canada usually collects manufacturing data on an actual basis annually. They did not do so in 1987 and 1991. The delay in compiling and publishing the data is approximately two years. In the interim, they generate monthly and annual estimates for product categories through the sampling techniques of the Survey of Manufacturers. This estimate is usually accurate within a three percent error range. The author tested the accuracy of the 1988, 1989 and 1990 survey estimates compared to the subsequent "count" and found the accuracy to be well within a one percent range for mobile homes and two percent for prefabricated buildings of wood.

#### 3.2 Industry Associations

The data compiled from Statistics Canada information has been preliminarily compared to the unit production figures reported to the industry association. CMHI collects quantity output figures from their respective members by province. We have compared the Statistics Canada data with that of CMHI for mobile and modular. The CMHI count is consistently about 25% lower than that of Statistics Canada; not all producers are CMHI members. The Statistics Canada data is consistent with the aggregation of provincial production statistics for the number of manufacturers who report to produce in the respective product categories.

#### 3.3 Provincial Data

Statistics Canada also publish the previously referenced data on a provincial basis. Quebec collects data from provincial manufacturers of manufactured housing independently of Statistics Canada. To test the reliability of the Statistics Canada data we obtained a copy of the annual manufactured housing statistical report of Ministry of Commerce of the Government of Quebec. The Quebec statistics are generally within 3% of those of Statistics Canada.

### **3.4 Trade Data**

Trade data is precise due to the paperwork requirements of international trade. Under the Canada/U.S. Free trade agreement import data is collected and reported monthly by the respective departments of Customs and Excise. This data is made available electronically by Statistics Canada with a two-month lag. The data is published for the same HS classifications as production data so it can be correlated. The tables included in the appendices were developed by downloading this data electronically.

## SECTION 4: UNITED STATES STATISTICS

*Task: Investigate sources for similar data in the United States. Undertake a sample analysis and test the reliability of data, as feasible, against other industry data.*

### 4.1 U.S. Data

#### 4.1.1 Government

##### 4.1.1.1 Domestic Production

Unlike Statistics Canada, the U.S. Bureau of Census only undertakes a "count" every five years. The last Survey of Manufacturing published data was 1987 and this year the survey is being undertaken for 1992 data. The resulting statistics will be available in early 1994. In the interim five year period, estimates are published annually based upon the Annual Survey of Manufacturers sampling techniques. The author also visited the U.S. Department of Commerce who published an industry profile based upon the 1987 data and plan to update it when the 1992 data becomes available.

The Bureau of Census provided the author with examples of data that they make available for a users fee and can be downloaded electronically. Table 4.1 has been constructed from this data.

**Table 4.1**  
**UNITED STATES MANUFACTURED HOUSING SHIPMENTS**  
(\$millions)<sup>12</sup>

Product	1987	1988	1989	1990	1991
Mobile Homes	3,814	3,876	3,731	3,801	3,582
Stationary	2,334	2,371	2,176	2,014	1,788
Pre-cut	1,179	1,203	1,114	1039	871
Modular	803	791	706	699	664
Not specified	352	377	356	276	253
<b>TOTAL</b>	<b>6,148</b>	<b>6,247</b>	<b>5,907</b>	<b>5,815</b>	<b>5,370</b>

<sup>12</sup>The total shipments of all prefabricated buildings in 1990 was U.S. \$9.1 billion comprised of mobile homes (44%), metal prefabricated (31%) and wood prefabricated (25%).

#### 4.1.1.2 Trade Data

Trade data is compiled by the U.S. Department of Commerce rather than the U.S. Bureau of Census. It is compiled by HS code with a two-month lag. Statistics Canada make available the Department of Commerce trade data electronically. HS 9406 trade statistics by country is available for all prefabricated buildings and for prefabricated buildings of metal. Prefabricated buildings of wood data can therefore be calculated.

#### 4.1.2 Industry Data

U.S. industry trade associations and trade journals collect and publish much more product statistical data than their Canadian equivalents.<sup>13</sup> To illustrate this the monthly statistics of mobile home registrations in the U.S. is reproduced in the Appendices. This data is compiled from state government statistics on mobile home sales<sup>14</sup>. The data is considered by U.S. manufacturers as completely reliable.

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<sup>13</sup>This is probably due to as much the share of manufacturing housing in the residential housing market as to the size of the country relative to Canada.

<sup>14</sup>It is compiled by the National Conference of States on Building Codes and Standards.

## SECTION 5. A BUILDING PRODUCT EXAMPLE - WINDOWS

**Task:** *Investigate whether this method could be used for analyzing sales and trade data for selected building products used in residential construction.*

### 5.1 Availability of Data

The methodology proposed for manufactured housing could also be utilized to assess the comparative Canadian/U.S. markets for many categories of and some specific building products. Table 5.1 has drawn from Statistics Canada and US Bureau of Census monthly survey data based on SIC codes.<sup>15</sup>

**TABLE 5.1**  
**COMPARATIVE INDUSTRY DATA**  
**WINDOWS and DOORS PRODUCTION**  
**(\$millions)<sup>16</sup>**

Country	1988	1989	1990	1991	1992	annual growth rates
<b>Canada</b>	1,246	1,323	1,238	901	916	-10%
<b>U.S.</b>	5,094	5,429	5,438	5,106	<sup>17</sup>	0%

While the U.S. Bureau of Census Survey of Manufacturers is conducted at the five digit level, the Canadian survey is only conducted at the four digit level. Unless the four digit Canadian SIC code is a single specific product, as is the case for mobile homes, the Canadian product production data will not be available for the two most recent years. Table 5.1 presents comparative production and trade data for the six digit SIC and HS codes for wood windows.

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<sup>15</sup>Unlike HS codes, both SIC code numbers and product descriptions are not harmonized between Canada and the U.S.

<sup>16</sup>This data can also be broken down to a ten digit level, e.g. windows covered with plastic, windows covered with metal, window sashes.

<sup>17</sup>This data is available for a users fee.

**TABLE 5.2**  
**COMPARATIVE INDUSTRY DATA**  
**WINDOWS**  
(\$millions)

Category	1988	1989	1990	1991	1992	annual growth rates
<b>Canada</b>						
Production <sup>18</sup>	507.7	515.0	487.9			< - 2%
Exports		8.2	9.7	14.4	22.0	51%
Imports		27.1	24.6	21.4	25.9	< - 2%
Imports from U.S.		26.3	23.8	21.3	25.7	< - 1%
Market size		535.7	502.8			
<b>United States</b>						
Production	2373	2496	2533	2403	<sup>19</sup>	< 1%
Exports						
Imports		18.3	17.9	20.6	29.5	20%
Imports from Canada		8.2	8.3	13.2	19.5	17%
Imports from Mexico		2.5	2.7	3.1	6.6	88%

<sup>18</sup>This data can also be broken down to a ten digit level, e.g. windows covered with plastic, windows covered with metal, window sashes.

<sup>19</sup>This data is available for a users fee.

## 5.2 Windows Industry Data

The lack of Statistics Canada data for some building products for the most recent two years is illustrated in Table 5.2. The four digit code of Table 5.1 production data for Canadian SIC code 2543 "Windows and Doors" has been disaggregated to a five digit SIC (windows) level by utilizing Statistics Canada seven level data for HS 25.4418.1. "Windows and frames". The 1991 and 1992 Canadian data of Table 5.1 cannot be disaggregated until the Statistics Canada Census of Manufactures data is published, usually with a two-year lag.<sup>20</sup>

## 5.3 Analysis

A comparison of the production and trade data between the two countries permits several observations to be made:

- The 1990-91 recession has had a much deeper impact on the Canadian industry than the U.S. industry. The decline in window output in Canada was 32% compared to 6% in the U.S.
- The windows industry in both Canada and the United States has been extremely domestically oriented. Trade amongst the two countries and third countries (imports) has amounted to approximately 5% for Canada and 1% for the United States. Total trade has primarily been between North American.
- Over the past four years the competitive position of the Canadian industry has not deteriorated. The balance of trade has been unchanged. From a very small base, Canadian exports to the U.S. have increased substantially to a declining U.S market while Canadian imports have been static in a declining market.
- Although one year does not make a trend, Mexican exports to the U.S. substantially increased in 1992.
- The United States market is approximately five times that of the Canadian market as defined by value of output, less than the relative ratio of annual housing unit starts of the two countries.<sup>21</sup>

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<sup>20</sup>The equivalent U.S. data relating to the Canadian SIC code is arrived at by aggregating five digit codes, in the case of windows and doors 25311 to 25315.

<sup>21</sup>Including the exchange rate differential.

## SECTION 6. ALTERNATIVE APPROACHES & RECOMMENDATIONS

*Task: Suggest alternate approaches to achieve the objective of the proposed larger study, if the above method is not deemed workable and/or if other approaches may be less costly.*

### 6.1 Assessment of Proposed Methodology

The research undertaken in this preliminary statistical investigation demonstrates that the methodology proposed for the main study is appropriate for the three major manufactured housing industry segments.<sup>22</sup> This preliminary investigation revealed that the required data sources are diverse and require considerable labour in accessing and collating the relevant data.

For some building products, and the disaggregation of pre-cut and modular units, Canadian production data may involve a two-year lag. For pre-cut and modular, Statistics Canada Annual Survey of Manufacturers and industry data can be used to create a disaggregated estimate. This methodology cannot be utilized for log homes and post and beam construction.

### 6.2 Association Surveying

The two major industry trade associations, CMHI and MHAC count, as members, the majority of Canadian manufacturers; and are aware of most of the manufacturers in each product category. The number of log home and post and beam manufacturers in Canada is less than 150 making a statistical census economic. The associations could undertake a quarterly mail and follow up telephone survey of these two sectors that would make available industry production and trade data. Such a survey would also facilitate the development of a data base for these two industry segments.

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<sup>22</sup>Defined as monetary shares of the total manufactured housing market.

### 6.3 Recommendations

1. To improve the useability and relevance of Statistics Canada data, Canadian manufactured housing industry representatives and stakeholders should collaborate on revisions to the product categories and data collection forms currently utilized by Statistics Canada. During the course of the research for this report, Statistics Canada personnel expressed an interest in pursuing such an endeavour.
2. The lag in Statistics Canada publication of manufactured housing starts is one and a half years since the Survey of Manufacturers does not collect data on units produced, only value. With manufactured housing becoming an important segment of the housing market, CMHC should consider developing a process to collect annual data on units produced and implementing it, as it does for the site building industry as an integral part of its existing national housing market mandate.
3. The conclusion that can be drawn from the example of the window industry statistics is that ISTC could publish an industry trends analysis by building product category\product that could be made available to Canadian manufacturers within its mandate of service to Canadian industry.
4. The proposed research study should be oriented towards producing a comparative industry survey report on the Canadian, U.S., EEC and Japanese manufactured housing markets<sup>23</sup>. The results would be widely circulated in the industry through a mailing to all Canadian manufacturers listed in Statistics Canada data base, provincial ministries of housing and industry as well as involved federal departments and agencies.

### 6.4 Alternative Approaches

A global survey of the manufactured housing industry could be undertaken. The major international markets for manufactured housing are North America, Japan, and the EEC. It is expected that central and eastern Europe will become a major market. Manufactured housing has captured 60% of the U.S. market, 20 % of the Japanese market. We have researched the availability of data on the market in Japan which we

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<sup>23</sup>Mexico could be included in the U.S. report.

have been able to confirm is that is available. Data for selected EEC countries is also available.

The traditional statistical approach to forecasting export levels is to establish a time series relationship between changes in industry demand and change in exports. It is possible to correlate U.S. industry market demand utilizing the available U.S. market data described in Section 4 with Canadian exports utilizing a statistical correlation computer program. This would yield a historical quantitative relationship between the change in U.S. market demand and the change in Canadian exports. If Canadian exports increase more than expected, our competitiveness has increased and, of course, visa-versa.

This methodology is most effective when exports represent a substantial portion of one or both of the respective trading partner markets. For the product markets reviewed in this report, the level of trade in stationary manufactured housing and windows and doors is too low for this methodology to be an effective forecasting tool. It could be used for the mobile home industry.

## SECTION 7. OUTLINE OF WORK

*Task: Prepare an outline of work that would have to be performed to collate available data into a form suitable to perform a statistical analysis.*

### 7.1 Association Survey & Data Base

To obtain statistical data on log and post and beam production CMHI could undertake a survey of Canadian manufacturers. The total number of producers is less than 150. This would also allow for the creation of a data base for the two industries. The Statistics Canada listing of manufactured housing producers would be used as the population base for a mail and follow-up telephone survey.

### 7.2 Comparative Industry Study

#### 7.2.1 Scope of Work

1. A statistical review of the production and trade figures, by types of manufactured housing, for the markets of Canada and the United States. A similar survey could be undertaken in subsequent phases for Mexico, the European Economic Community and Japan.
2. A structural analysis of the industry will be undertaken that will reveal the growth segments of the industry and identify the segments that are the most competitive in export markets and those prone to import competition.

#### 7.2.2 Study Activities

Activities will overlap due to the integrated nature of the consultancy objective. The tasks identified in the previous section will be organized in the following activities:

- Stakeholders will be interviewed to establish specific outputs tailored to their unique needs. They will include CMHI members, CMHC and ISTC.

- Sources of research data will be contacted including Statistics Canada, U.S. Department of Commerce and the U.S. International Trade Commission and product trade associations.
- International Trade data for manufactured housing will be obtained through the U.S. International Trade Commission.
- An industry structural analysis will be undertaken that will reveal market shares and rates of growth for industry segments. Rates of change in levels of imports and exports will be used as proxies for evaluating the international competitiveness of the Canadian industry segments.

### 7.2.3 Work Plan Stages

The three geographical market reports (U.S., the EEC and Japan) would be undertaken in three sequential phases, although the time-consuming task of data collection would be initiated in the preceding phase for each stage.

### 7.2.4 Research Report Format

The survey report would be based on a statistical analysis with a narrative that would accompany a graphical presentation. It would be produced in a desktop publishing format (Pagemaker) with spreadsheet graphics (EXCEL).

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