

**C I N T R A F O R**

**Working Paper**

**100**

**Niche Market Opportunities for Alaska  
Forest Products in Japan (2005 Update)**

**Daisuke Sasatani  
Joseph A. Roos  
Allen M. Brackley  
Ivan L. Eastin**

**December 2005**

**CINTRAFOR**

**Working Paper 100**

**Niche Market Opportunities  
for Alaska Forest Products in  
Japan (2005 Update)**

**Daisuke Sasatani  
Joseph A. Roos  
Allen M. Brackley  
Ivan L. Eastin**

December 2005

Center for International Trade in Forest Products  
College of Forest Resources  
University of Washington  
Box 352100  
Seattle, WA 98195-2100

This material is based on work supported by USDA Forest Service, Pacific Northwest Research Station, Wood Utilization Center, Sitka, AK. Opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the funding agency.

Technical Editor: Angel Ratliff

## EXECUTIVE SUMMARY

Alaska exports to Japan decreased dramatically during the 1990's. This decline was caused by a variety of factors including the Japanese recession, a reduced Alaska timber supply, exchange rates, a market shift from green lumber to kiln dried lumber, and increased global competition. However, in 2005 Japan's GDP, stock market, real estate, and consumer price index were up from the previous year indicating a strong economic recovery. Furthermore, the U.S. Dollar has weakened against the Japanese yen and many economists predict that the U.S. Dollar will continue to decline against the yen due to historically high U.S. fiscal and trade deficits. This will give Japanese companies more purchasing power for U.S. forest products.

In addition to economic changes, Japan's demographics are changing rapidly. In the first half of 2005, Japan's net population decreased and the population will continue to decline to the 1960's level of 100 million by 2050. While Japan's general population is decreasing, the percentage of population over 65 is growing rapidly as the baby boomers reach retirement age. According to a survey published in the Nikkei Weekly Newspaper, one area baby boomers expect to spend money on when they retire is their house. The total size of Japan's remodel market was 7.0 trillion yen (US\$ 60.3 billion) in 2003. The remodel market increased in 2003 and is predicted to increase as more baby boomers retire.

As explained above, the Japanese market has shifted from green lumber to kiln dried lumber. Alaska has more than doubled their kiln dry capacity since the late 1990's and this opens up Japan's kiln dried lumber market. Additionally, the Ketchikan Wood Technology Center has established Alaska-specific lumber grade marks to differentiate Alaska timber species' unique characteristics. The Japanese market has always valued quality and there is now an opportunity to communicate Alaska lumber quality by promoting these new grade marks in Japan.

The results of this research suggest that many niche markets exist for Alaska forest products:

### **1. Tract housing power builders**

Tract housing developments built by a new category of builder called "power builders" have increased in Japan's urban areas. This is a growing market segment in Japan and these power builders are large enough to import Alaska forest products in large quantities.

### **2. Kiln dried lumber**

Alaska has substantially increased its kiln dried lumber capacity recently. Japan's ten year warranty building requirement has increased demand for kiln dried lumber. There is ample demand for kiln dried lumber in both the 2x4 and post and beam housing markets.

### **3. Lamstock market**

There has been an increase in demand for engineered wood and the number of Japanese glulam manufacturers. The results of the Ketchikan Wood Technology Center Alaska species testing program have shown Alaska lumber has superior strength properties compared with many other species making it suitable for lamstock.

### **4. Pre-cut lumber market**

Almost 75 percent of Japanese post and beam starts used pre-cut lumber. Japan's pre-cut lumber mills are a strong market to target with lumber sizes that could be used with their pre-cut lumber machines. The lumber sizes vary based on the application.

### **5. Alaska yellow-cedar for sill plate (*dodai*)**

Due to its natural decay resistant properties, Alaska yellow-cedar is very popular for sill plates and other structural lumber used in ground contact applications in Japan.

### **6. Alaska yellow-cedar for garden accessories and tubs**

Alaska yellow-cedar's decay resistant properties make it an excellent species for outdoor garden accessories such as

decking and decking accessories, benches, gazebos, and lattice. As explained earlier, there are a lot of retirees in Japan and this number will be increasing. Many retirees spend more time in their gardens and the demand for garden accessories is expected to increase.

Also, Alaska yellow-cedar is considered a substitute for *hinoki*, (Japanese falsecypress). Japanese people traditionally take a bath daily. Soaking tubs are especially popular in Japan and most detached houses have one. An Alaska yellow-cedar tub could be developed and positioned as an upscale alternative to a *hinoki* tub.

#### **7. Home improvement market for retirees**

Japan's baby boomers are approaching retirement age. Many Japanese retiring workers receive a large lump sum payment, which they often use to improve their house. The senior home improvement market is expected to grow substantially as baby boomers start to retire.

#### **8. Remodel market**

The remodeling market is expanding. There is an opportunity for lumber producers to collaborate with builders specializing in remodels, architects, and designers to develop higher quality products to sell to Japan.

#### **9. Wood Chips**

It has been estimated that over 2.3 million acres of timber have been affected in the Kenai Peninsula by the spruce bark beetle. One potential application for beetle-killed spruce is wood chips. Japan has one of the largest pulp and paper markets in the world.

#### **10. Gift Market**

Japan's gift market has strong potential for smaller wood products and craft items. This market offers tremendous opportunity for smaller wood products that can be packaged and shipped easily. It would also make the gift more attractive if wood items are bundled with other "made in Alaska" items, such as smoked salmon.

#### **11. Brand Strategy**

As described above, the Ketchikan Wood Technology Center has registered proprietary grade marks for Alaska species. These grade marks are "Alaska Hem", "Alaska Yellow Cedar", and "Alaska Spruce". These three grade marks should be developed into a brand that communicates the quality of Alaska forest products to forest products manufacturers, pre-cutters, and homebuilders.

## TABLE OF CONTENTS

	<b>PAGE</b>
<b>Executive Summary</b> .....	<b>i</b>
<b>List of Figures</b> .....	<b>iv</b>
<b>List of Tables</b> .....	<b>v</b>
<b>1.0 Introduction</b> .....	<b>1</b>
<b>2.0 An Overview of the General Market in Japan</b> .....	<b>2</b>
2.1 Japan Macro Economics Overview .....	2
2.2 Exchange Rate .....	4
<b>3.0 Housing Industry</b> .....	<b>5</b>
3.1 Commercial And Residential Construction .....	5
3.2 Housing Starts .....	5
3.2.1 Power Builders.....	8
3.3 Remodeling Market .....	9
3.4 Materials Used.....	11
3.4.1 Pre-Cut Lumber .....	11
3.4.2 Engineered Wood .....	12
3.5 Japanese Imports from China .....	15
<b>4.0 Pulp and Paper</b> .....	<b>19</b>
4.1 Softwood Chips .....	20
4.2 Hardwood Chips .....	20
4.3 Pulp.....	21
<b>5.0 Demographic Trends in Japan</b> .....	<b>22</b>
5.1 Population Demographic .....	22
5.2 Senior Citizen Market.....	24
<b>6.0 Japanese Lumber and Log Import Data from the U.S.</b> .....	<b>26</b>
6.1 Historical Trends .....	26
6.2 Future Projections for Alaska Exports to Japan .....	32
<b>7.0 Opportunities for Alaska Forest Products Exporters</b> .....	<b>37</b>
<b>8.0 Future Research</b> .....	<b>39</b>
<b>9.0 Literature Cited</b> .....	<b>40</b>
<b>Appendices</b> .....	<b>42</b>
Appendix A .....	43
Appendix B.....	44
Appendix C.....	45
Appendix D .....	47
Appendix E.....	48
Appendix F .....	49
Appendix G .....	50
Appendix H .....	51

LIST OF FIGURES

		PAGE
Figure 2-1.	The Average Land Price for Residential Construction Use in Japan.....	2
Figure 2-2.	Nikkei Index (1985-2005).....	3
Figure 2-3.	Japan’s Consumer Price Index and Nominal GDP.....	3
Figure 2-4.	Yen Exchange Rate to U.S. Dollar .....	4
Figure 2-5.	Yen Exchange Rate .....	4
Figure 3-1.	Market Share of Commercial Construction .....	5
Figure 3-2.	Housing Starts .....	6
Figure 3-3.	Wooden Housing Starts by Structure.....	6
Figure 3-4.	Market Share by Construction Types of Wooden House .....	7
Figure 3-5.	Total Market Size of Remodel Market.....	9
Figure 3-6.	Number of Remodeling Projects.....	9
Figure 3-7.	Total Expenditure for Remodeling Construction.....	10
Figure 3-8.	Total Revenue and the Number of Home Improvement Retail Stores in Japan .....	10
Figure 3-9.	The Percentage of Post and Beam Houses Which Used Pre-cut Lumber .....	11
Figure 3-10.	Pre-Cut Mills Lumber Usage .....	12
Figure 3-11.	Domestic Production of Laminated Lumber and Glulam Beams.....	13
Figure 3-12.	Domestic and Imported Structural and Non-Structural Laminated Lumber .....	13
Figure 3-13.	Species Share of Connective Post ( <i>Kuda-Bashira</i> ).....	14
Figure 3-14.	Structural Laminated Lumber Imports by Country .....	15
Figure 3-15.	Foreign Direct Investment to China .....	16
Figure 3-16.	Chinese Forest Products Exports to Japan .....	17
Figure 4-1.	Production of Paper and Corrugated Board .....	19
Figure 4-2.	Pulp Wood Input.....	19
Figure 4-3.	Softwood Chip Exports to Japan by Country.....	20
Figure 4-4.	Hardwood Chips Exports to Japan by Country .....	21
Figure 4-5.	Pulp Exports to Japan by Country .....	21
Figure 5-1.	2003 Japanese Population Age Distribution .....	22
Figure 5-2.	Estimation Trend of Japanese Total and Elderly Population .....	22
Figure 5-3.	Baby Boomers Spending Plans after Retirement .....	24
Figure 6-1.	Softwood Log (Excluding Douglas-Fir) Imports from the U.S. and Canada in 2004.....	26
Figure 6-2.	Softwood Lumber Imports from the U.S. and Canada in 2004.....	26
Figure 6-3.	U.S. Sitka Spruce Log Exports to Japan .....	27
Figure 6-4.	U.S. Hemlock Log Exports to Japan.....	27
Figure 6-5.	U.S. White and Yellow-Cedar Log Exports to Japan .....	28
Figure 6-6.	U.S. Spruce, Pine and Fir (SPF) Log Exports to Japan.....	28
Figure 6-7.	U.S. Western Red-Cedar Log Exports to Japan.....	28
Figure 6-8.	U.S. Douglas-Fir Log Exports to Japan .....	29
Figure 6-9.	Index of U.S. Log Exports to Japan.....	29
Figure 6-10.	Index of Canada Log Exports to Japan.....	30
Figure 6-11.	U.S. Lumber Exports to Japan .....	31
Figure 6-12.	U.S. White and Yellow-Cedar Lumber Exports to Japan .....	31
Figure 8-1.	East Asian Currency Index Comparison .....	39

**LIST OF TABLES**

	<b>PAGE</b>
<b>Table 3-1. Estimate of Housing Starts and Private Residential Investment .....</b>	<b>7</b>
<b>Table 3-2. Estimate of Housing Starts by Usages.....</b>	<b>8</b>
<b>Table 3-3. China’s General Statistics (1995-2004) .....</b>	<b>16</b>
<b>Table 3-4. Chinese Forest Product Exports to Japan .....</b>	<b>17</b>
<b>Table 5-1. Population Change Prediction by Age Distribution.....</b>	<b>23</b>
<b>Table 5-2. Mean Monthly Household Income where the Head of Household is over 60 .....</b>	<b>25</b>
<b>Table 5-3. Mean Monthly Expenses by Age of the Head of Household in 2004 .....</b>	<b>25</b>
<b>Table 6-1. Board Foot Volume of Softwood Log Exports from Anchorage Customs District to Japan .....</b>	<b>32</b>
<b>Table 6-2. Cubic Meter Volume of Softwood Log by Species Percentage from Alaska .....</b>	<b>32</b>
<b>Table 6-3. Future Projections for Alaska Logs Exports to Japan .....</b>	<b>33</b>
<b>Table 6-4. Board Foot Volume of Softwood Lumber Exports from Anchorage Customs District to Japan ...</b>	<b>34</b>
<b>Table 6-5. Cubic Meter Volume of Softwood Lumber Imports from Alaska by Species Percentage .....</b>	<b>34</b>
<b>Table 6-6. Future Projections for Alaska Lumber Exports to Japan.....</b>	<b>36</b>
<b>Table 6-7. Dry Volume of Wood Chip Exports from Alaska to Japan .....</b>	<b>36</b>

## 1.0 INTRODUCTION

Japan has 24.1 million hectare (ha) of forest land. This is 64 percent of Japan's total land. Forty-four percent of Japan's forest land (10.6 million ha) is plantations, mostly planted after WWII (FAO 2001). *Sugi* (Japanese-cedar; *Cryptomeria japonica*) and *hinoki* (Japanese falsecypress; *Chamaecyparis obtusa*) are the two major softwood species in Japan. However, Japan's self-sufficiency in timber was only 18.6 percent in 2004 (Forest Agency 2003). Japan's topography is very steep, and it is extremely difficult to harvest timber on steep terrain. In addition, Japanese labor costs are notoriously high. These two factors raise the cost of Japanese domestic forest products. Cheaper imported forest products are available from the global market. Therefore, the Japanese sawmill industry is shrinking and this further supports demand for imported lumber products.

The Japanese economy is gradually recovering from a recession. As of August 2005, the Japanese economy has shown three consecutive quarters of growth (Nikkei 2005a). Other macro economic indicators including the unemployment rate, the Nikkei stock market index, and real estate prices have also improved. While the economy appears to be recovering, Japan's population is aging rapidly and this could change the demand for forest products. As the Japanese population ages, demand for new housing may fall while demand for repairs and remodels will increase.

Most imported logs and lumber are used for housing construction in Japan. In spite of the recession, Japan is second only to the U.S. in the number of annual wooden housing starts. According to the Office of Trade and Industry Information (2005), Japan is still the largest importer of Alaska forest products. Alaska forest products exports to Japan have decreased for a variety of reasons that will be discussed in the paper. However, the core reasons can be summarized as stricter environmental regulations, an increase in the number of supplier countries coupled with a decrease in total forest products demand. On the demand side, Japanese housing starts have decreased since 1996. On the supply side, Europe, Russia, and China entered the Japanese forest products' market during the 1990's and have consistently been increasing their market share.

Many opportunities exist for Alaska forest products in Japan if companies understand the current market trends, identify appropriate market niches resulting from these trends, and actively participate in Japanese marketing activities. The objective of this paper is to identify potential markets for Alaska forest products based on recent changes in the Japanese market.

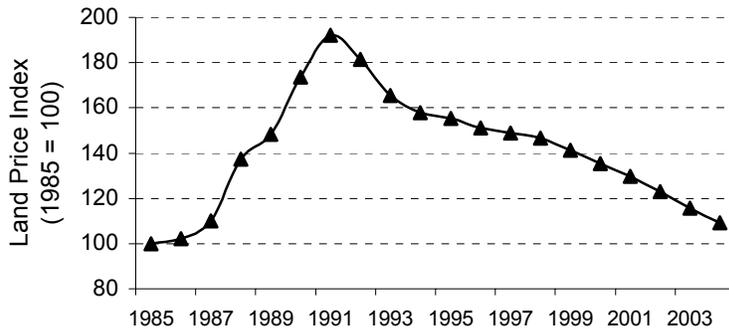
## 2.0 AN OVERVIEW OF THE GENERAL MARKET IN JAPAN

It appears that Japan's long recession is over and the economy is growing. Japan's 2005 macro-economic indicators including GDP, the Nikkei stock market index and the consumer price index, indicate the economy is recovering.

### 2.1 JAPAN MACRO ECONOMICS OVERVIEW

After the economic bubble burst in 1990, the Japanese economy has suffered from deflation, stagnant growth, and historically high unemployment (see Appendix A). However, there are some positive signs of economic recovery in 2005. First, much of the bad debt plaguing the economy has been written off. Second, in an effort to stimulate the economy, Prime Minister Junichiro Koizumi has initiated reforms to reduce government regulation and spending.

The period from 1986 to 1990 is called the "bubble economy" in Japan. After the Plaza Accord<sup>1</sup> in 1985, the Japanese yen strengthened which damaged Japanese exports and put pressure on the government to lower interest rates. As a result, interest rates dropped and many companies borrowed heavily and invested in the real estate and stock markets. The resulting speculation sent real estate and stock prices skyrocketing. As prices rose, companies continued borrowing against the artificially high values resulting in the collapse of the real estate and stock markets in 1990 (Figures 2-1 and 2-2).

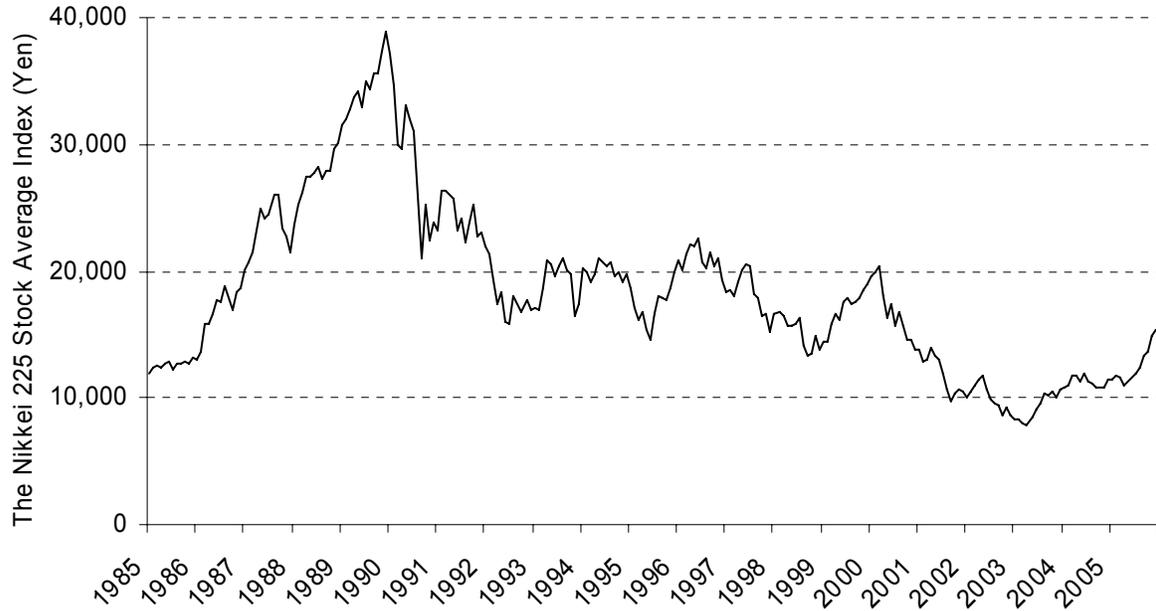


**Figure 2-1. The Average Land Price for Residential Construction Use in Japan**

(Source: Ministry of Internal Affairs and Communications, Statistic Bureau)

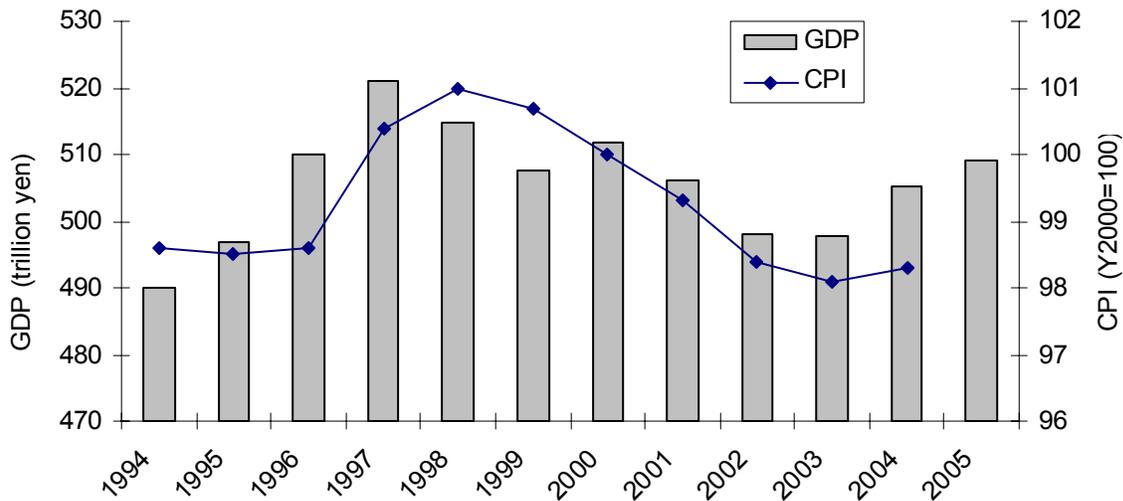
Contrary to the initial expectation that recovery would be just around the corner, the Japanese economy continued to decline. Then in 1997 the Hashimoto cabinet increased the sales tax from three to five percent, which reduced consumer spending, further restricting economic growth. Also, in 1997 the Asian Financial Crisis occurred. In an effort to keep the economy afloat, the Bank of Japan reduced its discount rate to near zero in February 1999. This led to capital flight as the Japanese sought off-shore investments with higher returns. The discount rate was increased in August of 2000, as GDP grew slightly, but the resulting deflation soon caused the Bank of Japan to reduce rates again (Figure 2-3).

<sup>1</sup> Finance ministers from World's five biggest economies announced the Plaza Accord in New York. Japan promised a looser monetary policy and a range of financial-sector reforms. All countries agreed to intervene in currency markets to bring the U.S. Dollar down.



**Figure 2-2. Nikkei Index (1985-2005)**  
(Source: Nikkei)

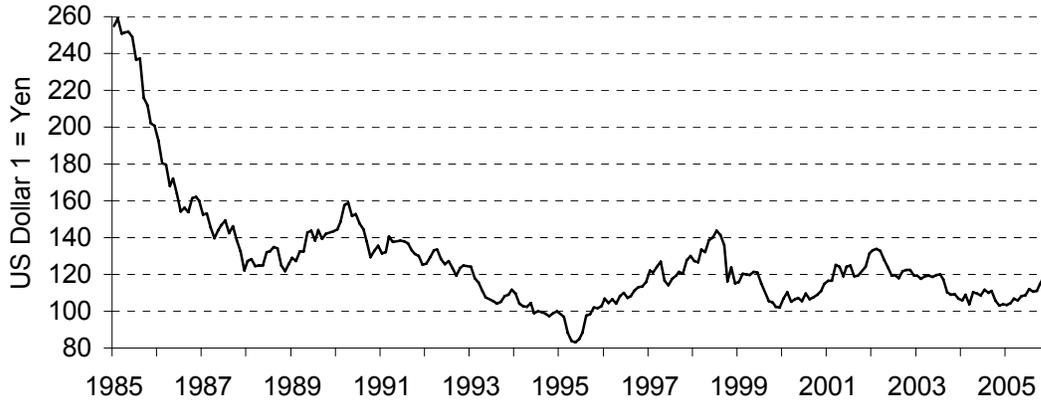
Finally, it appears as if the long awaited Japanese economic recovery has arrived. Japan's nominal GDP expanded two percent in 2003 and 1.9 percent in 2004 and growth is continuing in 2005 at an annualized rate of 1.8 percent (Nikkei 2005a). Additionally, the non-performing loans of Japan's largest banks decreased from 8.4 percent of their total portfolio in 2002 to three percent in 2005 (Economist 2005). This is freeing up capital that can now be used to finance home mortgages. This appears to be reflected in Japan's housing starts, which are up four percent for the first half of 2005. Another positive sign is that Tokyo land prices rose in 2004 for the first time since 1991. Finally, the Japanese stock market, as measured by the Nikkei 225 Index, has been steadily recovering since 2003 (Figure 2-2).



**Figure 2-3. Japan's Consumer Price Index and Nominal GDP**  
(Source: Economic and Social Research Institute, Cabinet Office)

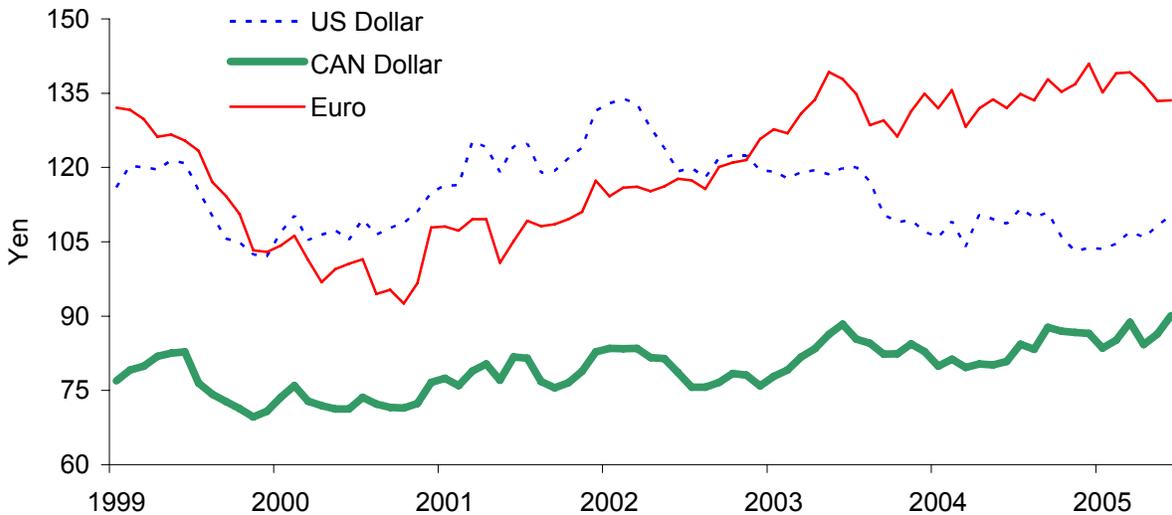
## 2.2 EXCHANGE RATE

In the late 1990's, as the Japanese economy suffered, the U.S. economy rode the wave of the dot com boom and global markets sold Japanese yen aggressively. Right before the dot com bubble burst in 2000, the U.S. Dollar was trading around 105 yen to the U.S. Dollar (Figure 2-4). After the collapse of the dot com bubble, the U.S. Dollar weakened substantially. As of December 9, 2005, the U.S. Dollar was trading at 120 yen to one U.S. Dollar.



**Figure 2-4. Yen Exchange Rate to U.S. Dollar**  
(Source: Economic and Social Research Institute, Cabinet Office)

There are many substitutes for U.S. timber and, as the U.S. Dollar strengthened during the last half of the 1990's, Japanese market share was lost to Europe and Canada. Douglas-fir beams and hemlock posts were replaced by European laminated wood. However, since 2002, the Euro has strengthened against the Japanese yen while the U.S. Dollar weakened (Figure 2-5). As the U.S. Dollar weakens against the Japanese yen, U.S. forest products become more price competitive, opening up opportunities in the Japanese market. However, as of the end of 2005, the Bank of Japan is continuing its near zero interest rate policy and this will influence the yen's exchange rate.



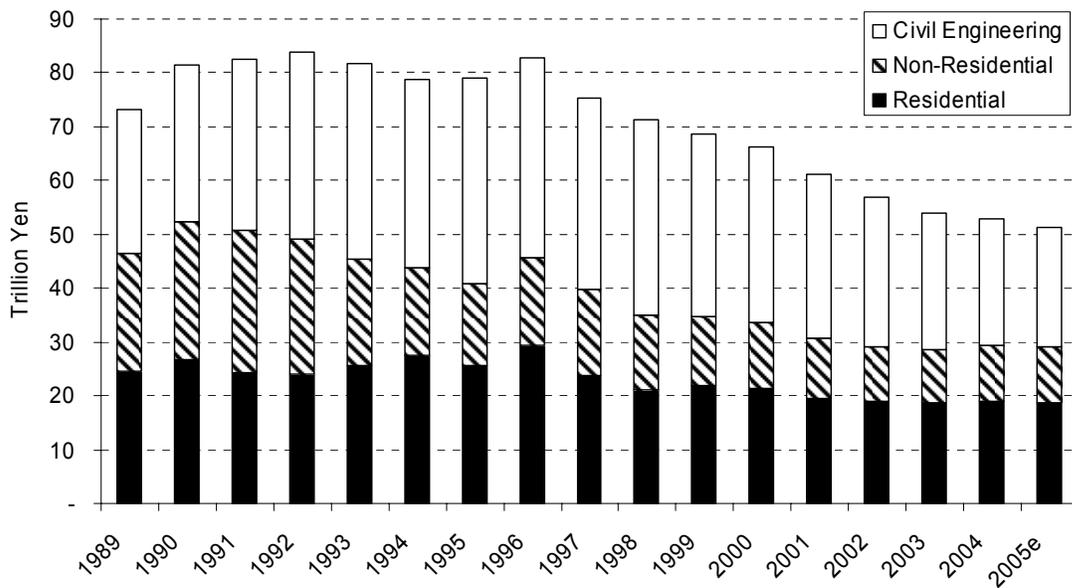
**Figure 2-5. Yen Exchange Rate**  
(Source: Economic and Social Research Institute, Cabinet Office)

### 3.0 HOUSING INDUSTRY

Housing starts have decreased since the 1990's due to a variety of reasons including Japan's recession and changing demographics. One of the biggest changes in Japan's residential post and beam construction industry has been the increased use of pre-cut lumber. This trend has propelled the use of laminated lumber because pre-cutters have increased their demand for laminated wood.

#### 3.1 COMMERCIAL AND RESIDENTIAL CONSTRUCTION

In spite of the stagnant growth in the 1990's, the Japanese wood housing market is still the second largest market in the world and offers a lucrative market for Alaska forest products. The size of the Japanese commercial and residential construction market was approximately 52.5 trillion yen (US\$ 485 billion<sup>1</sup>) in 2004 (Figure 3-1). Total construction investment was 20.1 percent of GDP in 1980, but it is estimated to have dropped to ten percent in 2005 (MLIT 2005b). The residential housing market is estimated as 17.8 trillion yen (US\$ 165 billion<sup>2</sup>) in 2005. Approximately 80 percent of lumber processed in Japan is used by the construction industry (Forest Agency 2003).



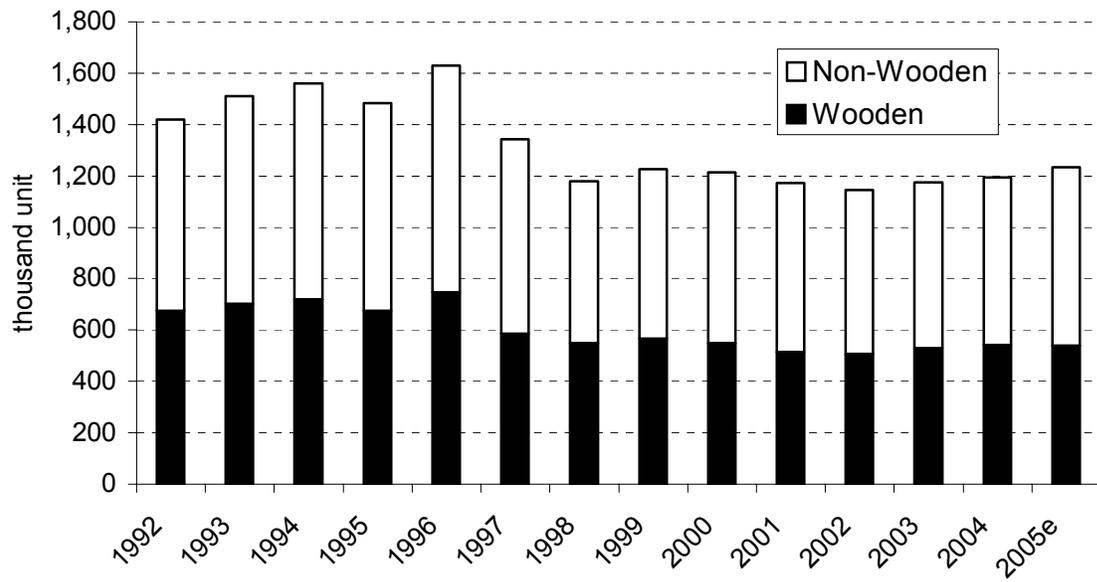
**Figure 3-1. Market Share of Commercial Construction**

(Source: Ministry of Land, Infrastructure and Transport)

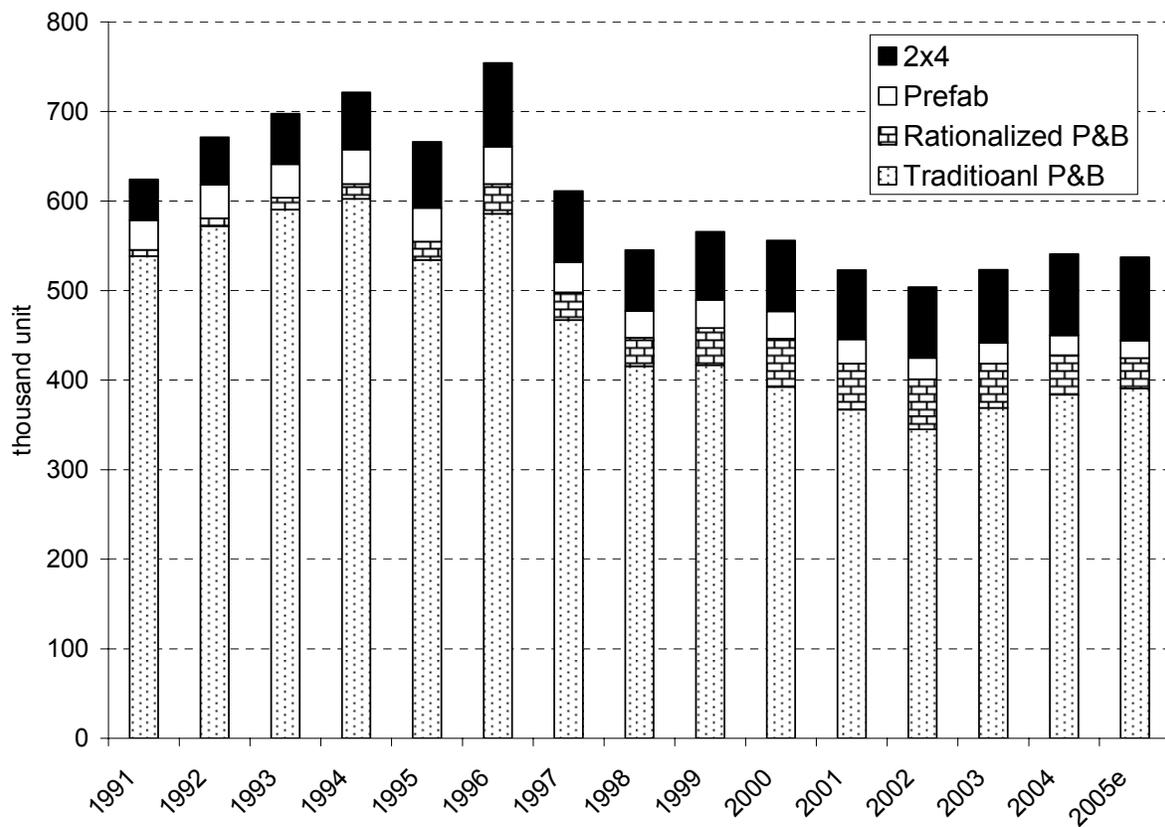
#### 3.2 HOUSING STARTS

Wooden housing starts comprise 45 percent of the residential construction market with the remainder being reinforced concrete and steel construction. Housing starts reached a ten year low in 2002 dipping to 1.15 million units and then recovered slightly by 2004 (Figure 3-2). Wooden housing starts are categorized by construction methods into three segments: Post and Beam, 2×4, and prefabricated construction (Figure 3-3). Post and beam is Japan's traditional construction method. The post and beam market consists of two segments. The first is the traditional post and beam and the second is rationalized post and beam. Rationalized post and beam construction is a modernized post and beam method that uses engineered wood, metal connectors, and wall panels. Total post and beam construction starts in 2004 were 428,000 units of which approximately ten percent were rationalized post and beam. The 2×4 construction market has shown consistent growth at the expense of the traditional post and beam market segment (Figure 3-4). The rationalized post and beam market share showed strong growth up until 2002, but has since leveled off. Recent growth combined with the younger generation's affinity for 2×4 housing, point to further growth in the 2×4 market segment. According to a 1999 public opinion poll, younger Japanese tend to prefer wooden 2×4 and wooden prefabricated homes over traditional style homes (Ogi 2002).

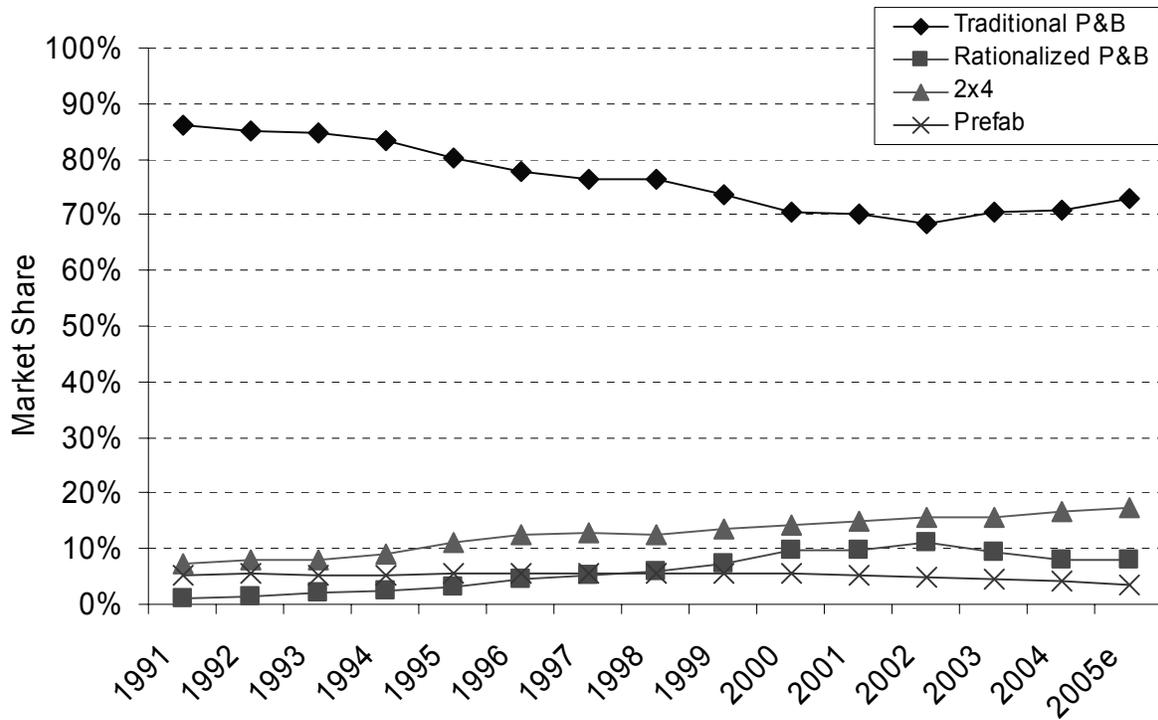
<sup>1</sup> US\$1=108.2 yen (2004)



**Figure 3-2. Housing Starts**  
(Source: Ministry of Land, Infrastructure and Transport)



**Figure 3-3. Wooden Housing Starts by Structure**  
(Source: Japan Wood-Products Information and Research Center and Japan Housing, and Wood Technology Center)



**Figure 3-4. Market Share by Construction Types of Wooden House**  
 (Source: Japan Wood-Products Information and Research Center)

According to the Research Institute of Construction and Economy (2003), the estimated longevity of a newly built house was 46 years in 2003, a 1.5 times increase from 1993. Although Japanese consumers prefer to build new homes, the result of Japan's longer lasting homes could be the expansion of Japan's secondary housing market. Consequently, the projected annual housing starts between 2006 and 2010 are 1.06 million units, which is approximately 90 percent of the 2001 to 2005 level (Table 3-1). Housing starts are projected to decrease further dropping to a level of 959,000 units between 2011 and 2015. This declining trend will be more pronounced for custom homes than for new sub-division homes and condominiums (Table 3-2).

**Table 3-1. Estimate of Housing Starts and Private Residential Investment**

	Estimation of Housing Starts		Estimation of Private Residential Investment (billion yen)	
	Total	Annual Mean	High Annual	Low Annual
<b>2001-2005</b>	5,818,859	1,163,772	18,571	18,571
<b>2006-2010</b>	5,291,578	1,058,316	17,362	17,362
<b>2011-2015</b>	4,794,363	958,873	16,508	16,270
<b>2016-2020</b>	4,117,771	823,554	14,828	14,261

(Source: Research Institute of Construction and Economy)

**Table 3-2. Estimate of Housing Starts by Usages**

	Total Starts	Owned House			Rent
		Custom House	Subdivision	Condominium	
<b>1991-1995</b>	7,317,788	2,597,645 (35.5%)	642,580 (8.8%)	859,072 (11.7%)	3,218,491 (44.0%)
<b>1996-2000</b>	6,590,625	2,438,955 (37.1%)	656,329 (10.0%)	986,680 (15.0%)	2,508,661 (38.1%)
<b>2001-2005</b>	5,818,859	1,859,326 (32.1%)	626,989 (10.8%)	1,035,294 (17.8%)	2,297,250 (39.5%)
<b>2006-2010</b>	5,291,578	1,871,816 (35.4%)	541,926 (10.2%)	874,846 (16.5%)	2,002,990 (37.9%)
<b>2011-2015</b>	4,794,363	1,696,345 (35.4%)	514,841 (10.7%)	859,575 (17.9%)	1,723,602 (36.0%)
<b>2016-2020</b>	4,117,771	1,452,918 (35.3%)	462,084 (11.2%)	794,930 (19.3%)	1,407,839 (34.2%)

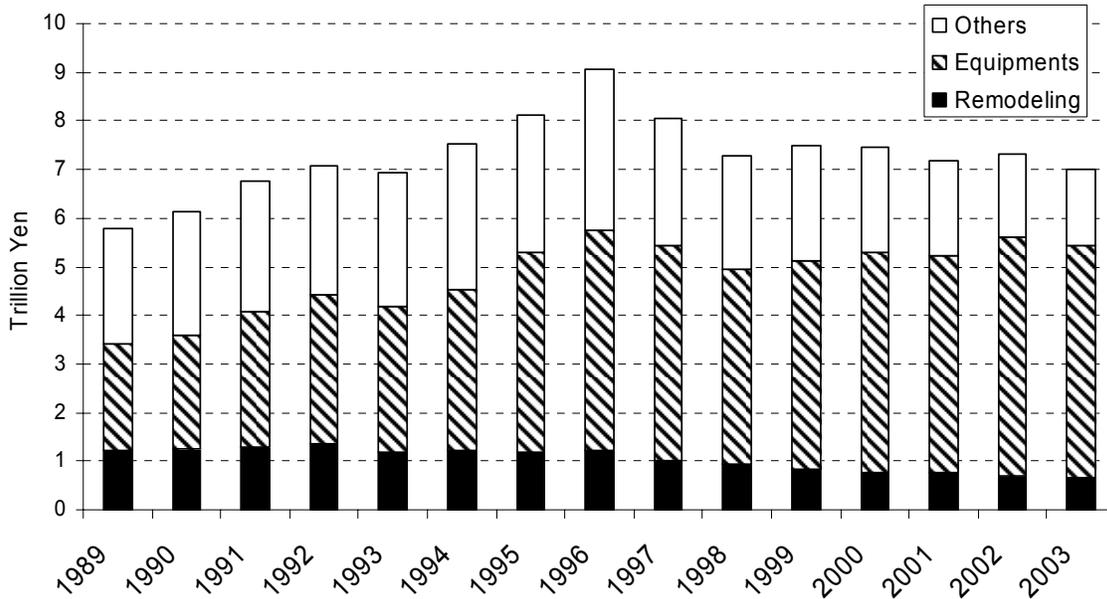
(Source: Research Institute of Construction Economy)

### 3.2.1 POWER BUILDERS

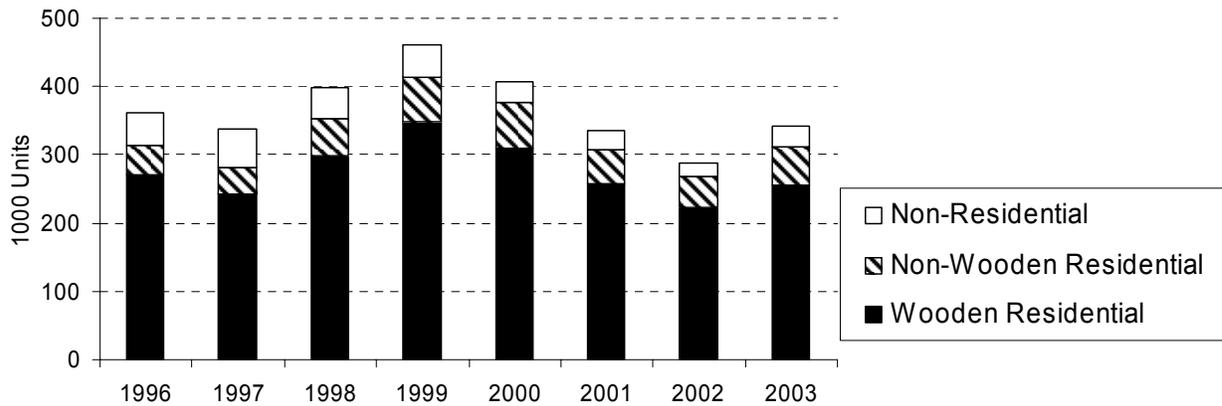
Recently, tract housing developments built by a new category of builder called “power builders” have increased in Japan’s urban areas. Before the emergence of power builders, builders were categorized as national builders, regional builders and contractors. National builders are large corporations that build houses in multiple prefectures. Regional builders are mid-sized companies that build houses in a specific region. The newly emerging power builders have been steadily increasing their market share (JLJ 2005b). Japanese builders have historically built custom homes on land owned by the homeowners. Power builders have differentiated themselves by purchasing large parcels of land, subdividing the land and building housing developments. Power builders have aggressively increased their market share at the expense of the small contractors who build custom homes. The main target market for power builders is the second baby boom generation. Power builders focus on their target market and build houses to fit the needs and wants of Japan’s younger generation. One area power builders have identified as being important to Japan’s younger generation of homebuyer is the government’s voluntary house performance evaluation rating system (Kitagawa 2005). Japan’s housing regulatory agency rates houses across nine criteria: 1) structure, 2) fire proof, 3) degradation, 4) maintenance, 5) heat efficiency 6) air circulation, 7) sunlight, 8) sound resistant, and 9) ease of use for elderly. Each category has a different range of scores and power builders emphasize ratings to market their homes. Therefore, power builders choose many of their building materials so their houses can score high on structural and other performance ratings while staying within their target price range. For example, power builders prefer using pre-cut laminated lumber over solid sawn lumber because laminated lumber scores higher on the structural rating system due to superior strength values. Since power builders are aggressively expanding their market share and are purchasing in large quantities, this is a market with good potential for Alaska exporters.

### 3.3 REMODELING MARKET

According to the Center for Housing Renovation and Dispute Settlement Support, the total size of Japan's remodel market was 7.0 trillion yen (US\$ 64.7 billion<sup>1</sup>) in 2003 (Figure 3-5). The remodeling market is composed of three areas: additions and renovations, repair and maintenance, and the consumption of durable household goods such as furniture and air-conditioners. The remodel market increased in 2003 and is predicted to increase further as the economy recovers. Experts predict it will reach 9.3 trillion yen (US\$ 85.6 billion<sup>1</sup>) market by 2010 (JETRO 2002). In addition to economic recovery, the government is expected to revise the Housing Standards Law to provide incentives to remodel old houses rather than tearing them down. Additional research has shown that when Japanese people retire they tend to spend large amounts of money to remodel their houses. The Ministry of Land, Infrastructure and Transportation (MLIT 1998) projects that the remodel market for elderly households will double by 2010.



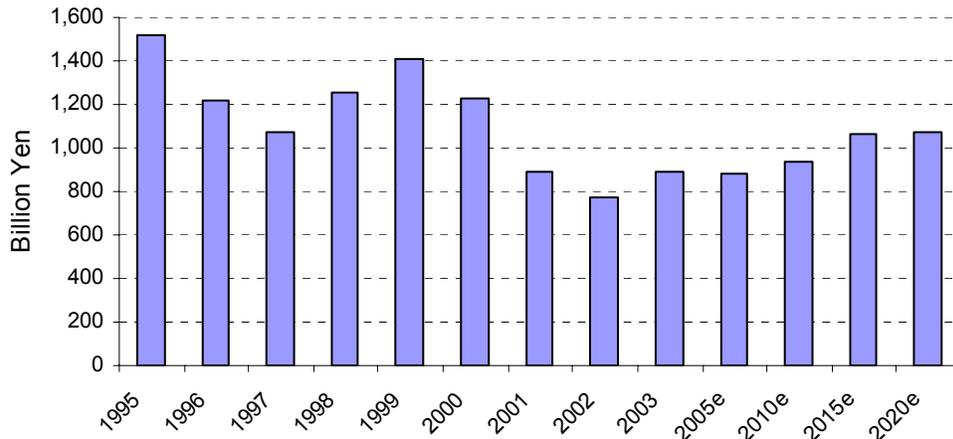
**Figure 3-5. Total Market Size of Remodel Market**  
(Source: Center for Housing Renovation and Dispute Settlement Support)



**Figure 3-6. Number of Remodeling Projects**  
(Source: Ministry of Land, Infrastructure and Transport)

<sup>1</sup> US\$1=108.2 yen (2004)

According to MLIT, the total number of additions, renovations and remodels were 341,913 in 2003 (Figure 3-6). This was a 19 percent increase from the previous year. Of these, 91 percent were residential houses. Furthermore, 83 percent of the residential houses remodeled are wooden construction. Total remodeling expenditures of residential houses bottomed out in 2002 at 772 billion yen (US\$ 7.13 billion<sup>1</sup>) and have since been gradually recovering (Figure 3-7). According to the Reform Construction News Paper (2003), this market will reach 1.06 trillion yen (US\$ 9.80 billion<sup>1</sup>) by 2015. As the remodel market expands, demand will increase for lumber, flooring, cabinets, interior wall panels, and other wooden building materials.

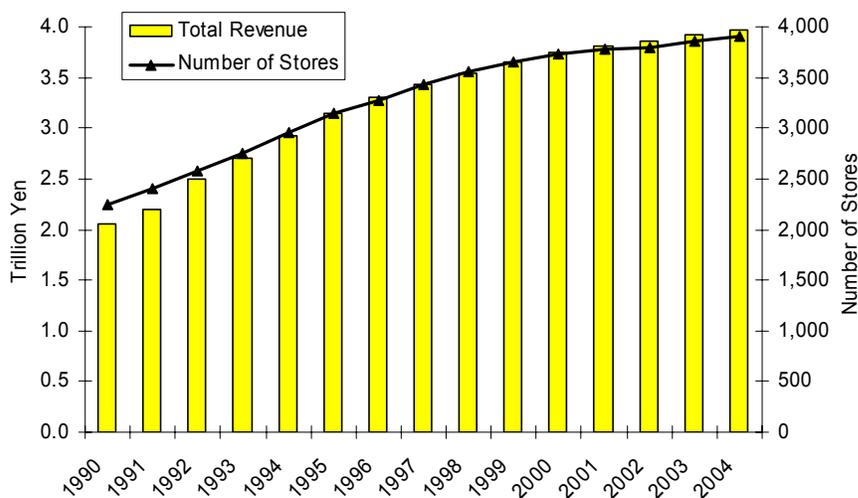


**Figure 3-7. Total Expenditure for Remodeling Construction**

\* 2005 to 2020 are projected by Yano Keizai Research Institute.

(Source: Ministry of Land, Infrastructure and Transport and The Reform Construction Newspaper)

Even during Japan's recession, the home improvement sector has shown strong growth. Total revenue was 3.97 trillion yen or US\$36.7 billion<sup>1</sup> in 2004 (Figure 3-8). This sector is still small compared with the U.S. home improvement market of US\$236.3 billion (Bucksot et al. 2004) and has ample room for growth. Many home improvement retailers are seeking foreign suppliers to differentiate their products from their competitors. This opens up opportunities for exporters to enter this market with lumber, building materials, and home and garden products. The home improvement retail sector has also become an important distribution channel to reach professional builders.



**Figure 3-8. Total Revenue and the Number of Home Improvement Retail Stores in Japan**

(Source: Japan DIY Industry Association)

<sup>1</sup> US\$1=108.2 yen (2004)

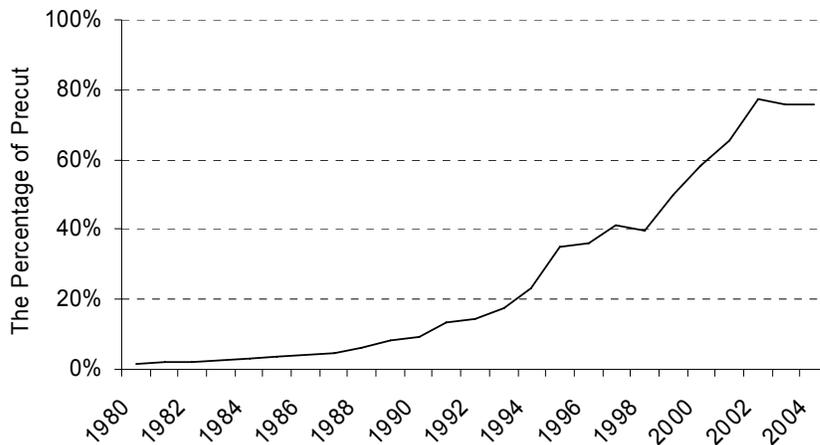
### 3.4 MATERIALS USED

Material use in Japan's residential construction market has changed dramatically since the early 1990's. The main shift has been from green lumber to kiln-dried (KD) lumber and engineered wood.

#### 3.4.1 PRE-CUT LUMBER

In Japan, pre-cut lumber is defined as lumber that is cut to specified dimensions and the mortise and tenon joints are routed in a factory and then delivered to the job site (see Appendix H). The lumber package is then labeled by assembly order and bundled together as a lumber house package. Traditionally, Japanese carpenters did all the mortise and tenon joints by hand on the job site, which was extremely labor intensive and time consuming. Pre-cut lumber was initially introduced in 1975 to offset a skilled labor shortage caused by retiring carpenters (JLJ 2005a). Since the lumber is pre-cut and the joints are routed by a computer controlled process in a factory, there are fewer defects. Pre-cut factories reduce labor costs, waste, and the number of claims arising from defective products.

In 1994, the percentage of post and beam houses that used pre-cut lumber was estimated at 23.4 percent (Fujisawa 2005). The Kobe Earthquake of 1995 stimulated pre-cut expansion. Then in May 1998, the Housing Quality Assurance Act (HQAA) was passed, which requires builders to warranty houses they build for ten years (Eastin et al. 2002). The result of the HQAA was that builders rapidly adopted pre-cut lumber which has minimal warping, twisting, and other defects. As shown in Figure 3-9, the percentage of post and beam housing starts that use pre-cut lumber was estimated at 76 percent in 2004 (Fujisawa 2005).



**Figure 3-9. The Percentage of Post and Beam Houses Which Used Pre-cut Lumber**  
(Source: Fujisawa, 2005)

Due to the precise dimensions required for joinery of pre-cut lumber, pre-cut factories demand uniform lumber quality with minimal defects. Laminated lumber is preferred by pre-cut factories because of its uniform qualities. In the mid-1990's, pre-cut factories began to utilize European whitewood laminated lumber. As of 2000, 48 percent of posts, 13.8 percent of balloon posts and 11.4 percent of cross beams were European whitewood engineered lumber<sup>1</sup>. As the Euro strengthens, there is opportunity for Alaska KD lamstock to be exported to Japan pre-cut manufacturers as a substitute for European whitewood.

The number of pre-cut factories reached its peak in 1999 with over 880 factories. However, as competition increased, bankruptcies and industry consolidation occurred (JLJ 2005b). Many efficient factories use the latest Computer Aided Design (CAD) system to increase efficiency. Some companies even established overseas CAD centers to utilize cheap labor for the time intensive data inputting process (Arai 2005). Furthermore, many pre-cut factories have adopted the ISO 9000 quality standards certification. In summary, the pre-cut industry has

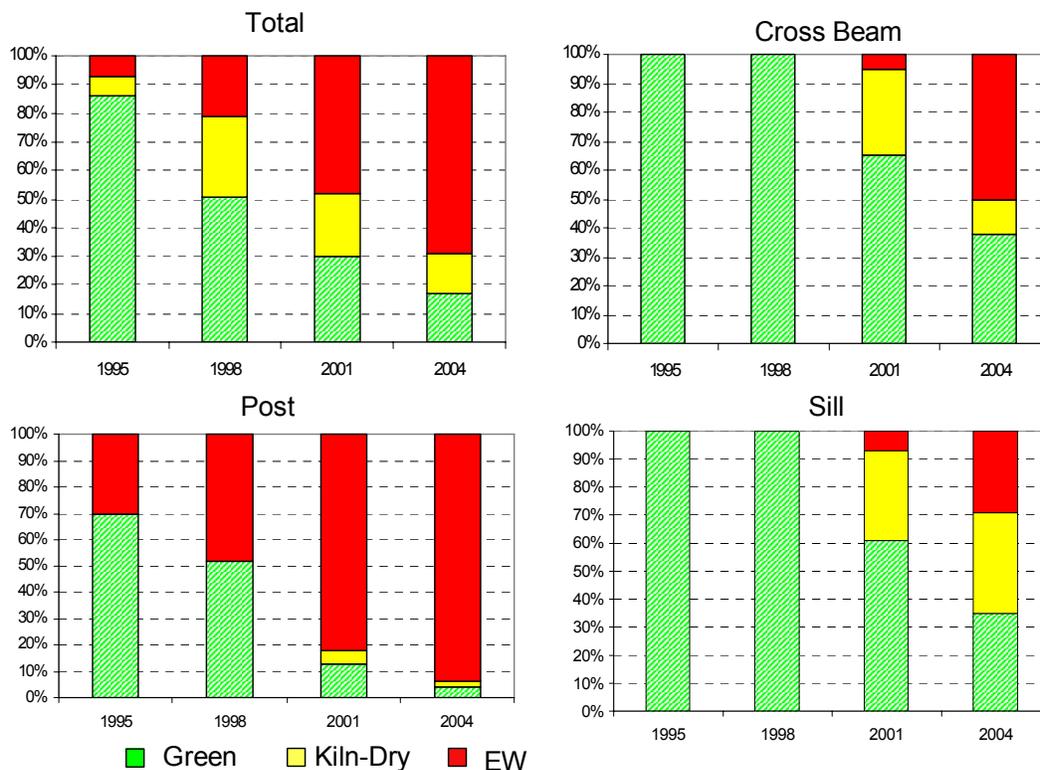
<sup>1</sup> See Appendix E "House Diagram"

revolutionized Japan’s residential construction industry and companies that want to export to Japan need to target this segment.

### 3.4.2 ENGINEERED WOOD

Engineered wood has made tremendous gains in the Japanese market. One issue in classifying Japan’s engineered wood product’s imports is that the international trade classification system does not have a clear engineered wood products definition (Theisen and Dirks 1996). Japan Laminated Wood Association (JLWA) divided engineered lumber into structural glulam and non-structural laminated wood. Structural glulam includes veneer wrapped and non-wrapped and non-structural laminated lumber also includes both veneer wrapped and non-wrapped non-structural laminated lumber.

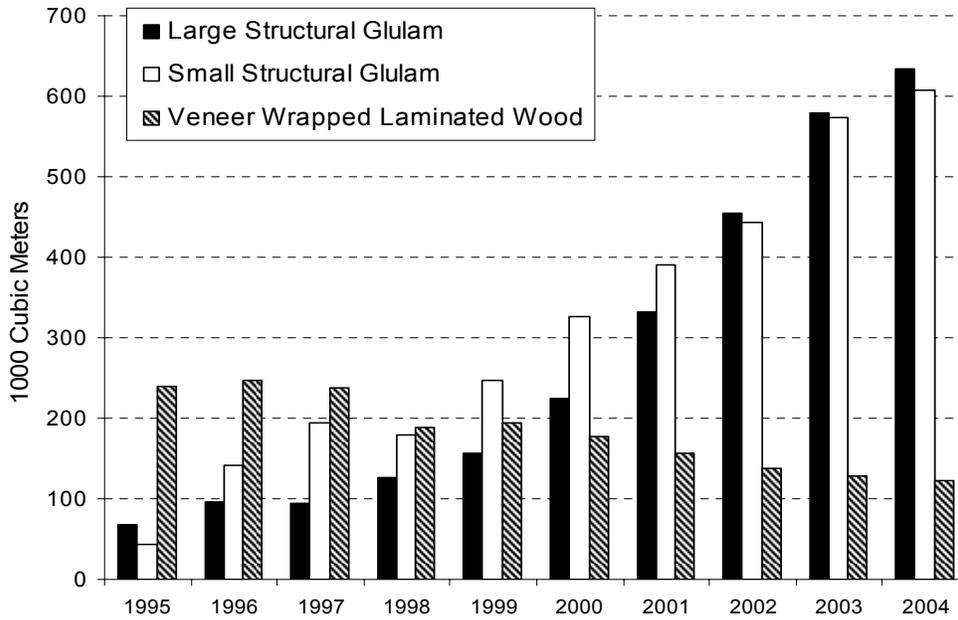
Regulatory changes encouraged the expansion of engineered wood. As a result of the Kobe Earthquake, the Building Standards Law (BSL) was revised in 1999 changing from a product specification approach to a performance specification approach. This allowed builders to use a larger variety of materials as long as they were certified to meet strength and other values. As described above, the HQAA, established and incorporated into the BSL, required builders to warranty their houses against defects for ten years. These standards dramatically changed the housing market. In order to avoid claims arising from the HQAA, builders increased their usage of engineered wood and pre-cut lumber. A large percentage of Japan’s precut market is now dominated by engineered wood (Figure 3-10).



**Figure 3-10. Pre-Cut Mills Lumber Usage**  
(Source: Japan Lumber Journal)

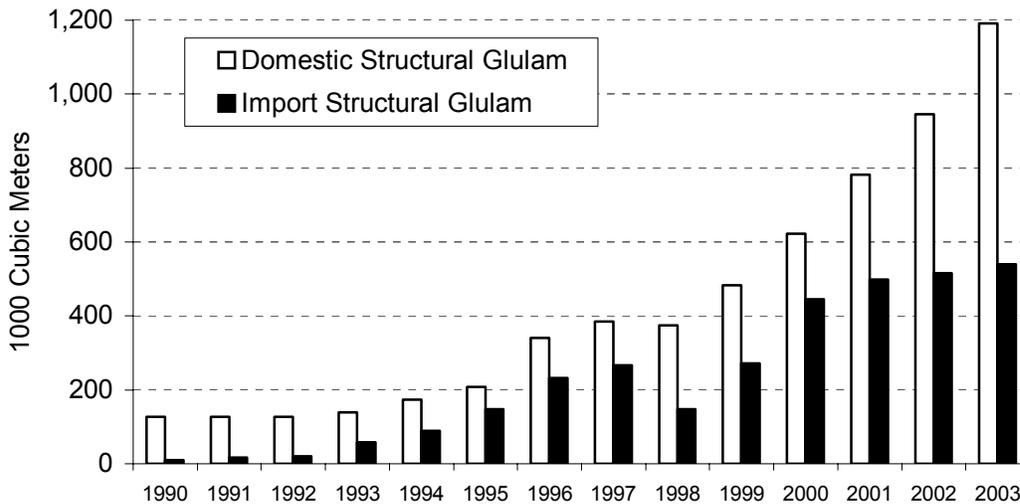
### Domestic Engineered Wood Production

Japanese domestic glulam production, especially structural beams, has increased (Figure 3-11). In contrast, laminated wood with veneer, which is used for appearance in Japanese traditional *tatami* rooms, has lost market share due to the decline in popularity of Japanese traditional rooms with exposed wood. Japanese traditional rooms with exposed wood are increasingly being replaced by rooms, where the structural lumber is hidden (see Appendix G). It is important to note that even in traditional post and beam houses, Japanese style rooms with exposed wood are being replaced by “western style” rooms. Younger people in Japan tend to prefer this style of room which they consider “modern.” The data suggests that the market for structural glulam will continue to increase while the veneer wrapped market will be stagnant.



**Figure 3-11. Domestic Production of Laminated Lumber and Glulam Beams**

(Source: JLWA)



**Figure 3-12. Domestic and Imported Structural and Non-Structural Laminated Lumber**

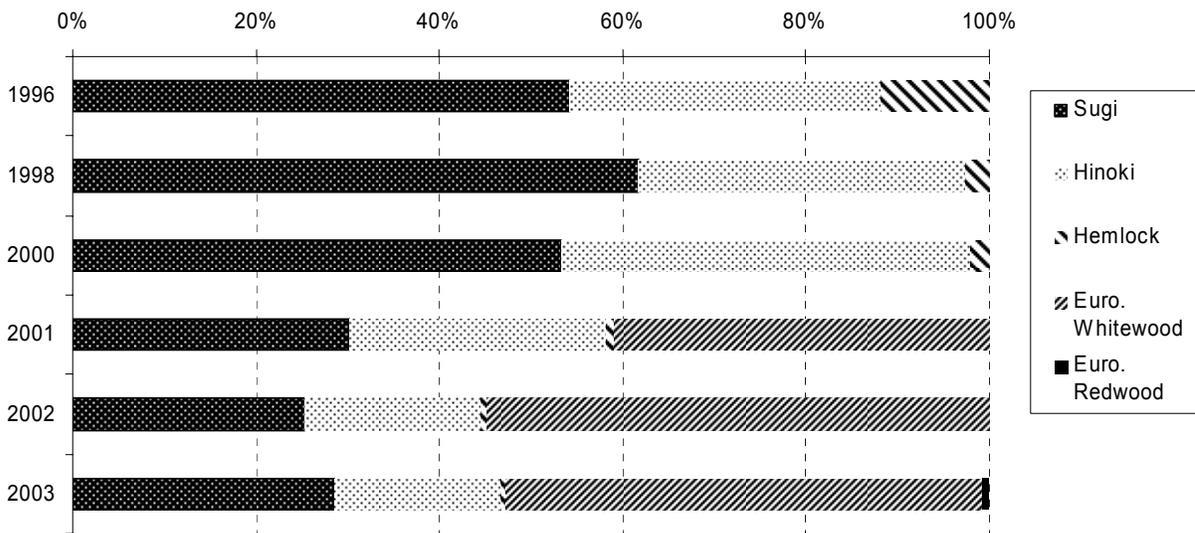
(Source: Domestic data from JLWA; Imports data from Ministry of Finance)

### Imported Engineered Wood

Imported engineered wood also has increased. The volume of engineered wood decreased in 1998 due to a decrease in housing starts caused by a sales tax increase in April 1997 and the Asian currency crisis (Figure 3-12). European laminated wood currently dominates the Japanese market. Imported laminated posts from Europe are mostly made from Norway spruce (*Picea abies*) and called “whitewood laminated wood” in Japan. According to the Government Housing Loan Corporation (GHLC), 29.4 percent of GHLC financed housing starts used laminated post in 1999 and 45 percent used laminated post in 2002 (GHLC 1999 and GHLC 2002). As shown in Figure 3-13, hemlock accounted for 11.8 percent of connective post<sup>1</sup> share in 1996, but dropped to less than one percent by 2003 (Takahashi 2004). Much of hemlock’s decline can be attributed to the increase of European imports.

In addition to hemlock market share loss, Japanese domestic species such as *sugi* and *hinoki* have lost market share, while the market share of European structural engineered wood has increased sharply (Figure 3-13). The 2004 import volume for structural engineered wood was 611,000 m<sup>3</sup>, four times the 1995 volume. Imports from Austria, Finland and China grew rapidly from 1995 to 2003 at annual rates of approximately 46 percent, 20 percent and 30 percent, respectively. As European market share increased, the U.S. market share has decreased (Figure 3-14). China, utilizing Russian timber, is expected to become an increasingly important player in the Japanese engineered wood products market.

Manufacturers of engineered wood products need to get Japan Agriculture Standard (JAS), Japanese Industrial Standards (JIS) or ministerial certification for their products in order to qualify for building codes. This is a time consuming process but is required for all products that generate VOC’s (volatile organic compounds including formaldehyde).

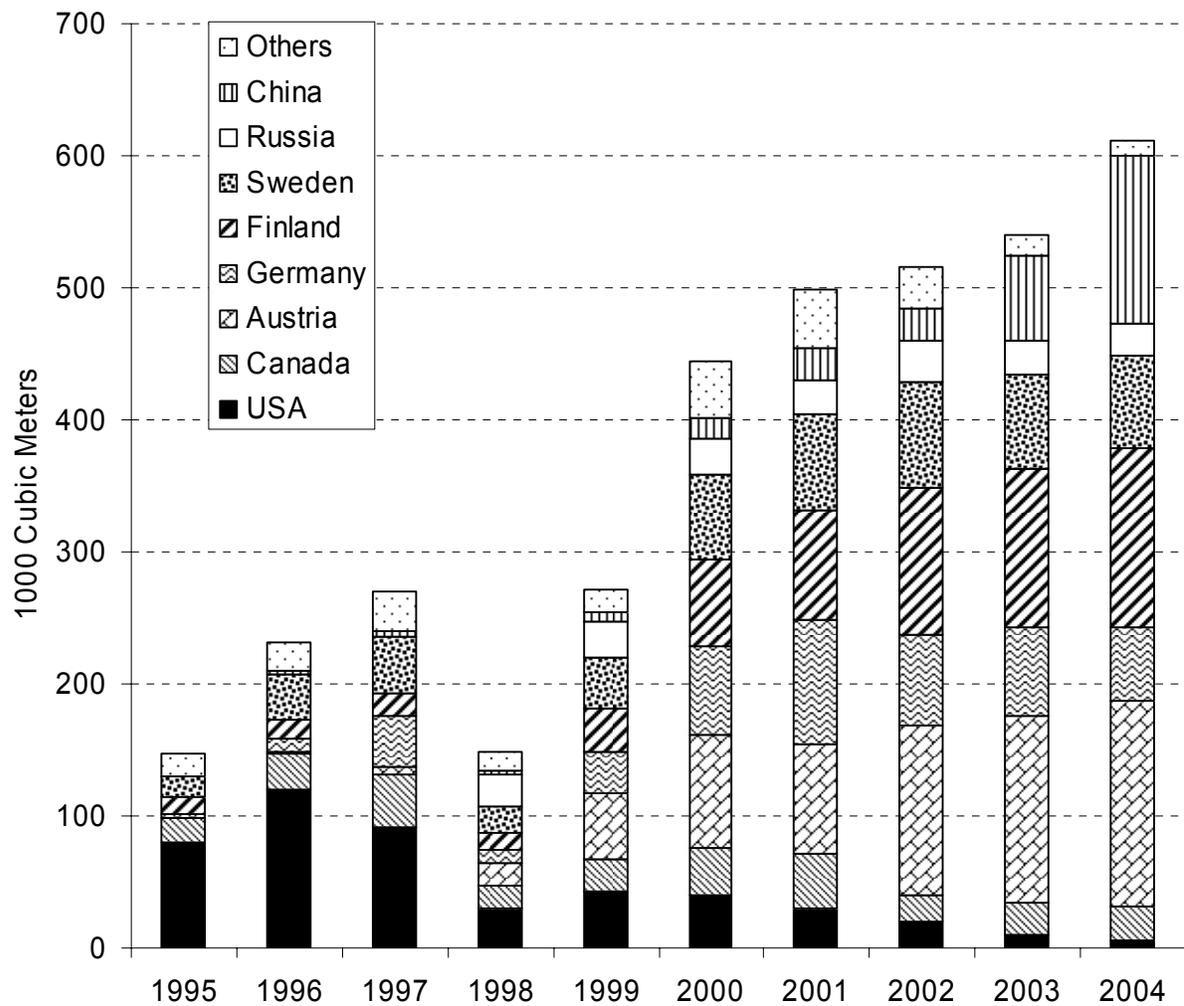


**Figure 3-13. Species Share of Connective Post (Kuda-Bashira)**

\* 1997 and 1999 data is not available.

(Source: Wood Industry 2004)

<sup>1</sup> See Appendix E “House Diagram”



**Figure 3-14. Structural Laminated Lumber Imports by Country**  
 (Source: Ministry of Finance)

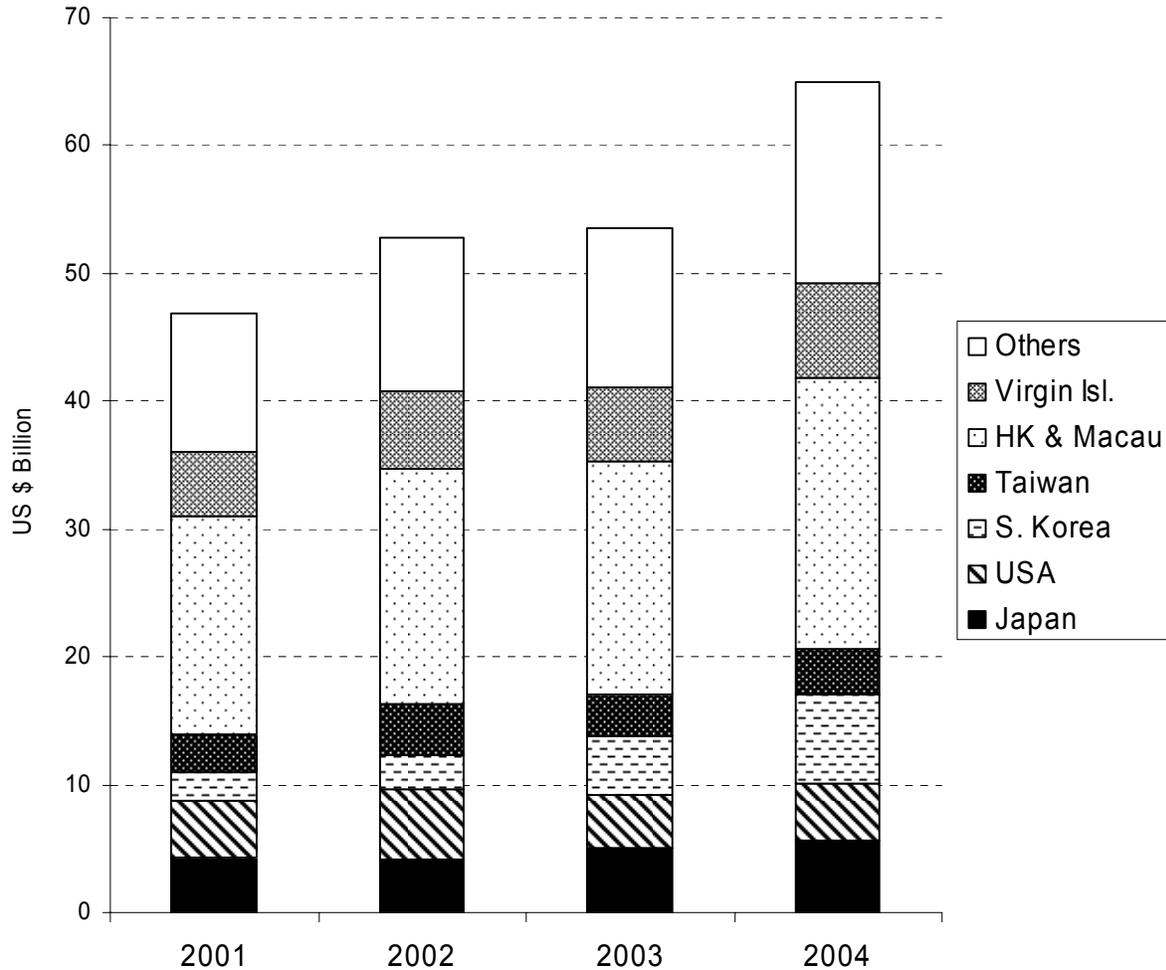
### 3.5 JAPANESE IMPORTS FROM CHINA

China's strong economic growth, cheap labor, production capability, and access to global timber supply are positioning China as the forest products manufacturing center of Asia. According to the Chinese government, annual GDP growth has averaged 8.7 percent from 1995 to 2004 (China Statistic Press 2005). The Consumer Price Index has decreased substantially since 1995 (Table 3-3). The population was 1.3 billion people in 2004, and 41.8 percent of the population lived in urban areas. The average annual income was 9,422 yuan (US\$ 1,130) in urban areas and 2,936 yuan (US\$ 354) in rural areas in 2004, and this was a 6.8 percent and 7.7 percent increase respectively from the previous year (China Statistic Press 2005). In 2003, US\$ 53.5 billion flowed into China from foreign countries (including Hong Kong/Macau). Hong Kong/Macau account for the largest portion of direct investment into China with US\$ 18.1 billion in 2003. Excluding Hong Kong/Macau and the Virgin Islands, Japan is the largest investor behind the United States with US\$ 5.1 billion in 2003. South Korea followed Japan, which increased 65 percent from 2002, and became the largest investor to China in 2004 excluding Hong Kong/Macau and Virgin Islands (Figure 3-15). On the other hand, U.S. and Taiwan slowed their direct investment in China.

**Table 3-3. China's General Statistics (1995-2004)**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>GDP (Billion US\$)</b>	700.2	816.5	898.2	946.3	991.4	1,081	1,176	1,271	1,418	1,654
<b>GDP per capita (US\$)</b>	578.1	667.1	726.7	758.5	788.1	852.7	921.3	989.2	1096	1269
<b>Growth Rate of GDP (%)</b>	10.5	9.6	8.8	7.8	7.1	8.0	7.5	8.3	9.5	9.5
<b>Increment Rate of CPI (%)</b>	17.1	8.3	2.8	-0.8	-1.4	0.4	0.7	-0.8	1.2	3.9
<b>Unemployed Rate (%)</b>	2.9	3.0	3.1	3.1	3.1	3.1	3.6	4.0	4.3	4.2

(Source: National Bureau of Statistics of China)

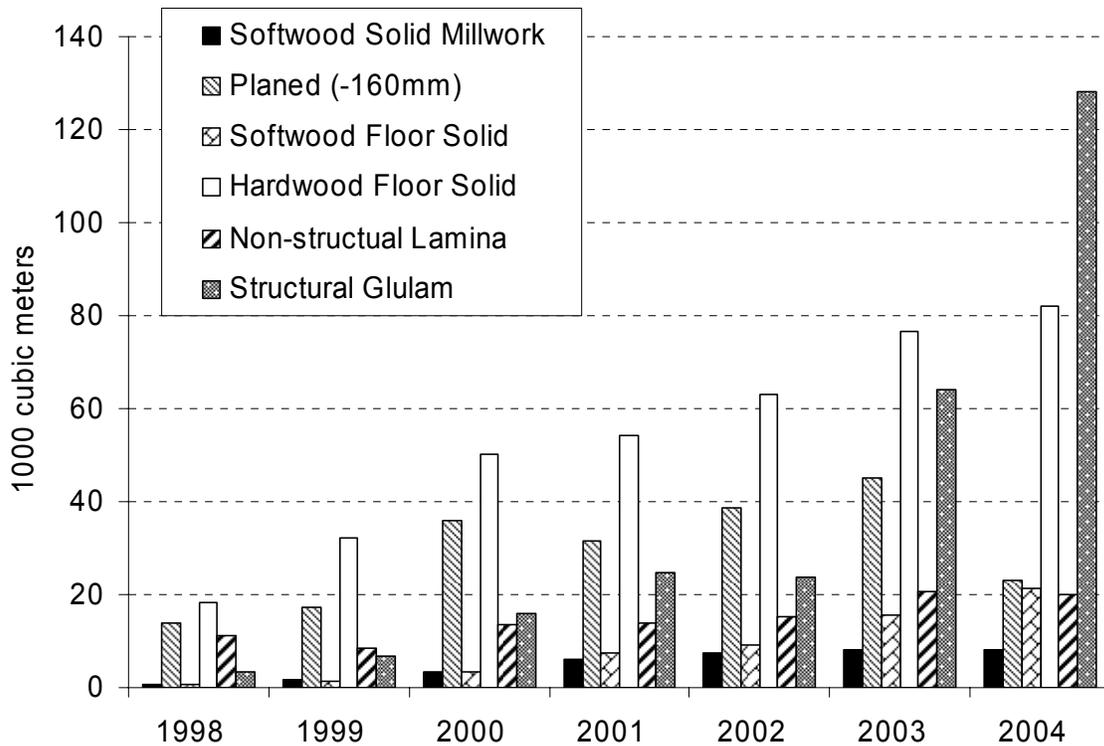


**Figure 3-15. Foreign Direct Investment to China**

\* 2004 data is an annual estimate utilizing monthly data through September 2004

(Source: China Statistical Yearbook)

China is a resource poor country that imports raw materials, manufactures products and then exports these products. China is one of the fastest growing forest products exporters to Japan. In 2004 China exported 128,000 m<sup>3</sup> of structural laminated lumber to Japan, which was a five-fold increase from 2002 (Figure 3-16). Also in 2004, exports of wood windows to Japan was 447,000 kg and exports of wood doors was 28 million kg. These figures were 170 percent and 140 percent increases from the previous year, respectively (Table 3-4).



**Figure 3-16. Chinese Forest Products Exports to Japan**

(Source: Ministry of Finance)

**Table 3-4. Chinese Forest Product Exports to Japan**

	Window Frames (kg)	Door (kg) (Western style)	Doors, shutters, removable screens and posts for Japanese traditional rooms ( <i>Tategu</i> ) (kg)
1994	45,991	248,979	55,608
1995	6,747	659,371	192,445
1996	42,035	752,669	448,893
1997	65,199	804,571	428,868
1998	1,289	528,303	137,069
1999	23,041	437,032	78,008
2000	39,377	943,687	110,428
2001	40,214	1,268,821	211,990
2002	74,813	3,319,372	222,731
2003	258,430	19,607,680	325,444
2004	446,569	28,352,532	408,423

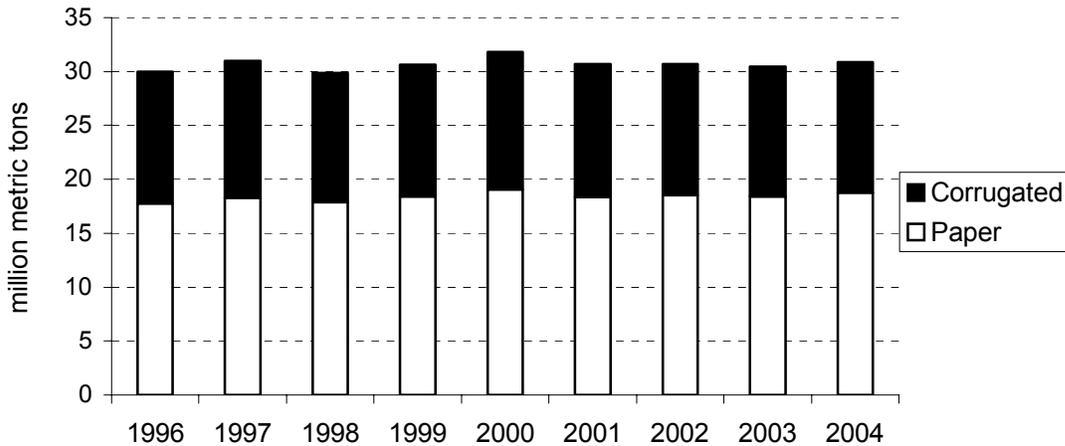
(Source: Ministry of Finance)

Many Japanese forest products companies have established joint ventures in China and are gradually shifting their manufacturing base to China. The quality of Chinese forest products is improving while prices remain significantly lower than their North American counterparts. The future of North America's export success in Japan lies in concentrating on products that do not compete directly with China on price.

The Chinese yuan was pegged to the U.S. Dollar until July 2005 when the People's Bank of China officially announced that the Chinese yuan would be pegged to a basket of foreign currencies and would trade daily within a narrow band (The People's Bank of China 2005). As a result, the yuan appreciated 2.2 percent to 8.28 yuan to one U.S. Dollar. It is not clear which currencies are included in the basket, but most people believe that the Chinese basket system may be similar to Singapore's current system. Singapore has a system called the "basket, band and crawl" (Burton 2005). This system manages the Singapore dollar against an undisclosed basket of currencies composed of major trading partners and competitors. One can conclude that any future appreciation of the yuan will occur very slowly as the Chinese government tries to maintain export fueled economic growth, while responding to global pressure to further revalue the yuan.

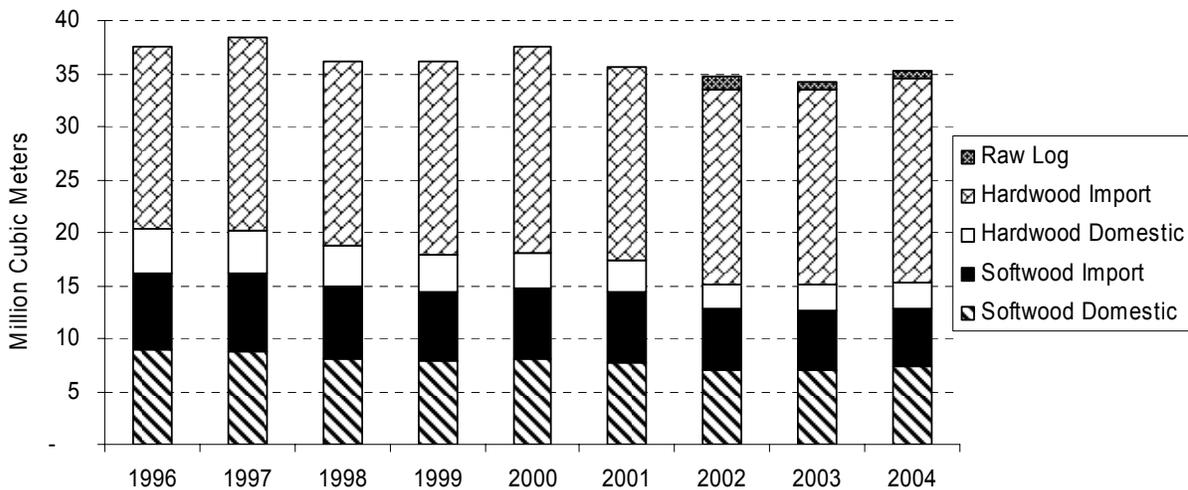
#### 4.0 PULP AND PAPER

Pulp and paper manufacturing is a major sector of Japan's economy. Total annual revenue was 6.9 trillion yen (US\$ 59.3 billion<sup>1</sup>) in 2003 and accounted for 2.6 percent of Japan's manufacturing sector (METI 2004). The total production of paper and paperboard increased during the 1990's and has leveled off at 30 million metric tons (M.T.) annually. In 2004, total paper production was 18.8 million M.T. and total corrugated board production was 12.1 million M.T. (Figure 4-1). Japan is the third largest paper and paper board manufacturer in the world behind the U.S. and China (METI 2001). Currently, there are three major trends in Japan's paper industry: 1) a shift from wood pulp to recovered paper, 2) a shift to imported hardwood, and 3) a shift to wood imported from plantations (Watanabe 2002). According to the Japan Paper Association (2005), 59.6 percent of paper and paper board manufacturing utilized recovered paper in 2002. As shown in Figure 4-2, only imported hardwood has increased in the pulp wood category.



**Figure 4-1. Production of Paper and Corrugated Board**

(Source: Ministry of Economy, Trade and Industry)



**Figure 4-2. Pulp Wood Input**

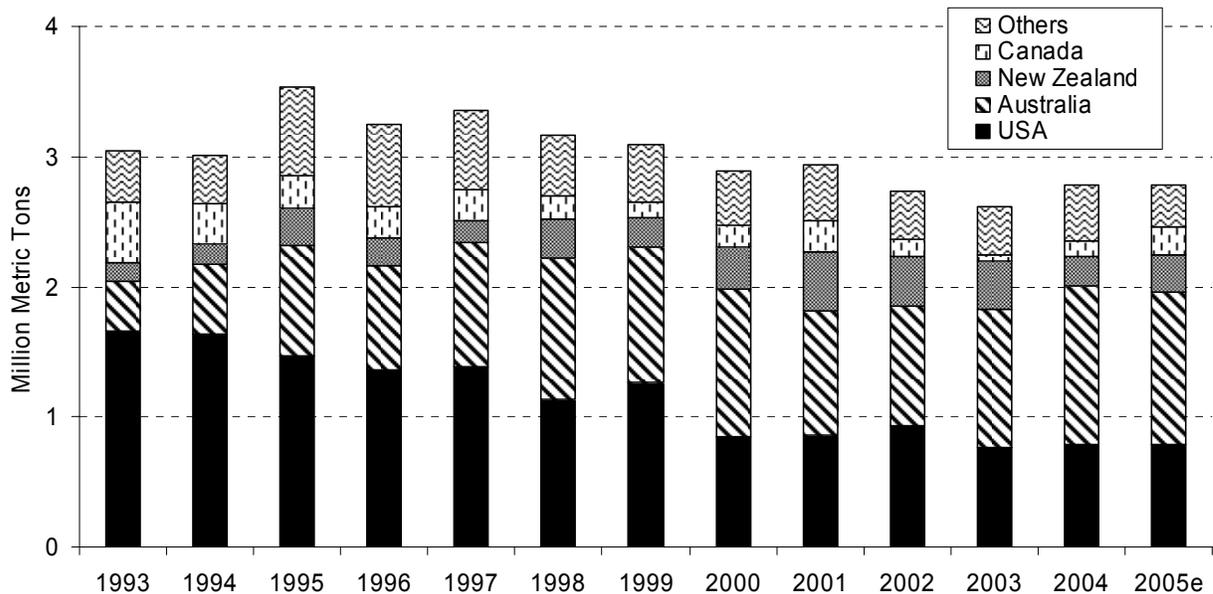
\* New category raw log has been added since 2002. Previous raw logs are included in other categories.

(Source: Japan Paper Association)

<sup>1</sup> US\$1 = 116.3 yen (2003)

#### 4.1 SOFTWOOD CHIPS

Japanese imports of softwood chips were 2.8 million M.T. in 2004, a 6.3 percent increase from the previous year (Figure 4-3). However, the amount of imported softwood chips is slowly declining as companies utilize more recycled paper. The largest softwood chips exporter to Japan in 2004 was Australia with 1.2 million metric tons. This amount is more than double what Australia exported in 1994. Radiata pine (*Pinus radiata*) and slash pine (*Pinus elliottii*) are the two main species from Australia. Imports from the U.S. of softwood chips have declined substantially since the 1990's to a market share of 28.3 percent (789,000 M.T.) in 2004. New Zealand, Brazil, Fiji and Canada follow the U.S. with 8.2 percent, 6.3 percent, 5.3 percent and 4.3 percent market shares, respectively. According to Japan's customs clearance statistics, the average F.O.B (net of freight) per ton chip price was US\$ 136.01 for U.S. chips and US\$ 132.14 for Australia chips in 2004. This was an increase from the respective average F.O.B. prices of US\$ 130.12 and US\$ 118.38 in 2003. Russian chips were the cheapest at US\$ 117.79 per ton.

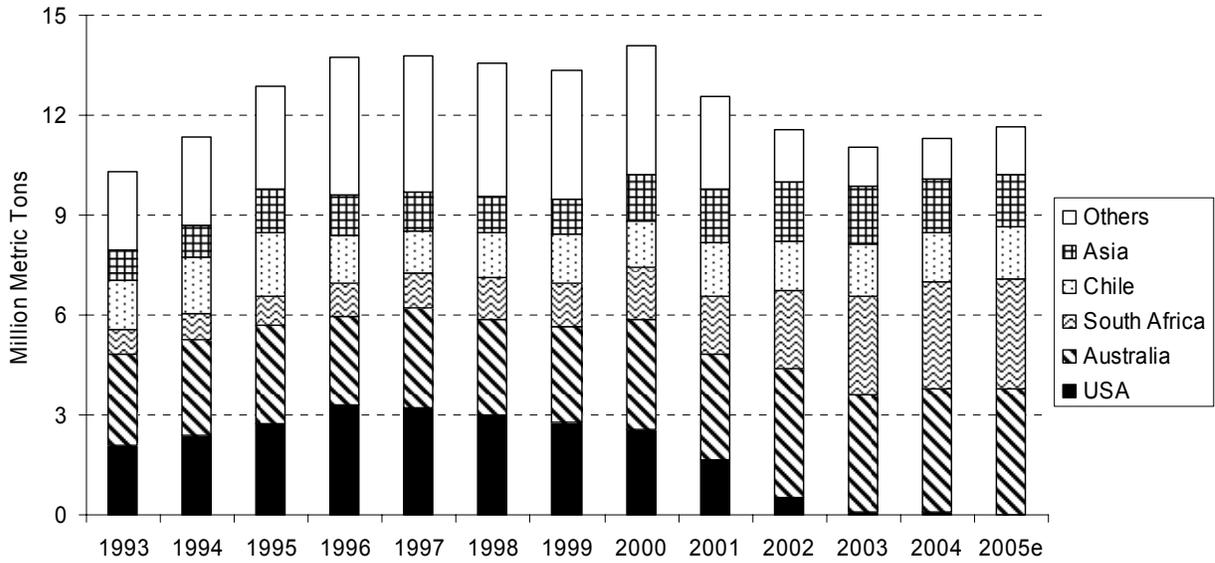


**Figure 4-3. Softwood Chip Exports to Japan by Country**  
(Source: Japan Customs Statistic)

#### 4.2 HARDWOOD CHIPS

Japan hardwood chip imports were 11.2 billion M.T. in 2004, almost four times the quantity of softwood chip imports. However, as with softwood chips, hardwood chips have also declined due to the increasing use of recycled paper. Hardwood fiber lengths are shorter than softwood fiber lengths and are used for finer paper with lower strength requirements, such as print paper. Australia was the largest hardwood chip exporter to Japan, exporting 3.7 million M.T. in 2004. This was followed by South Africa (3.2 million M.T.) and Chile (1.5 million M.T.) (Figure 4-4). The U.S. market share in Japan for hardwood chips, which was 29.2 percent in 1998, dropped to 0.8 percent (92,000 M.T.) by 2004. According to Japan's customs clearance statistics, the average F.O.B price of Australian hardwood chips was US\$ 151.16 per ton in 2004, while the average F.O.B. price from U.S. was US\$ 127.29. However, most U.S. hardwood chips are shipped from the southern United States making the landed Japan costs for U.S. chips more expensive than for Australia chips (Miyadokoro 2005).

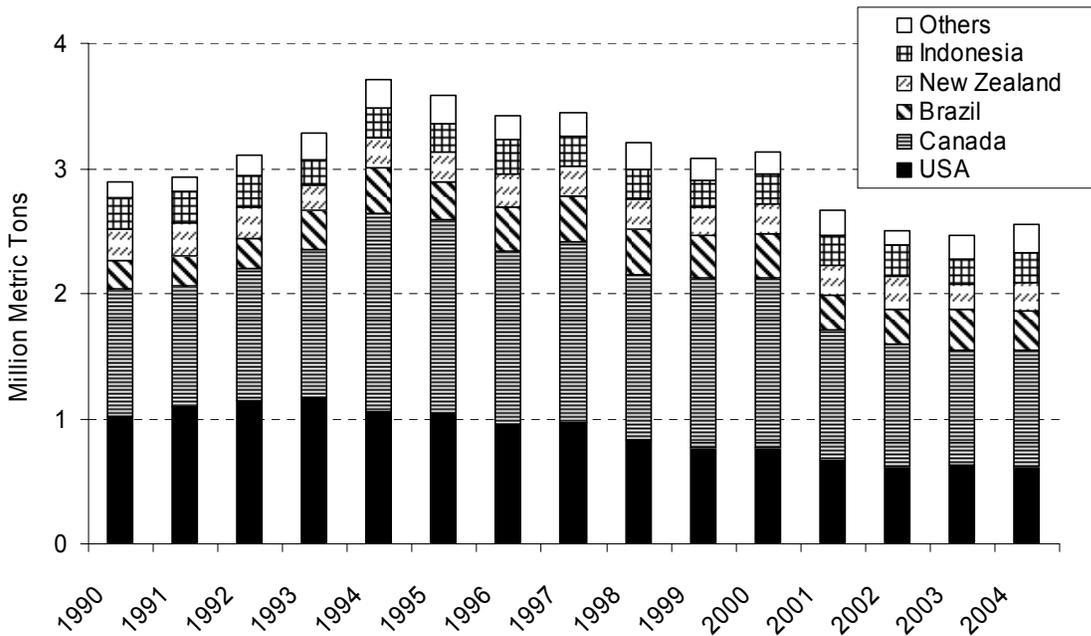
Due to environmental concerns, Japanese companies are trying to reduce imports from tropical forests and increase hardwood chips from plantations. One example is Japan's largest pulp and paper company, Oji Paper Group. This company currently sources eight percent of its chips from its plantations in Australia, New Zealand, China, and Vietnam. Oji plans to expand its foreign plantation ownership to 300 thousand hectare by 2010, which will supply approximately 16 percent of its total chip consumption (Oji Paper Group 2005).



**Figure 4-4. Hardwood Chips Exports to Japan by Country**  
 \* Asia includes Vietnam, Thailand, Indonesia and China.  
 (Source: Japan Customs Statistic)

**4.3 PULP**

The U.S. and Canada are major pulp exporters to Japan. In 2004, the U.S. exported 616,000 M.T. and Canada exported 934,000 M.T. of pulp to Japan. However, the amount of U.S. exports to Japan has decreased as the amount of pulp use in Japan has decreased (Figure 4-5).



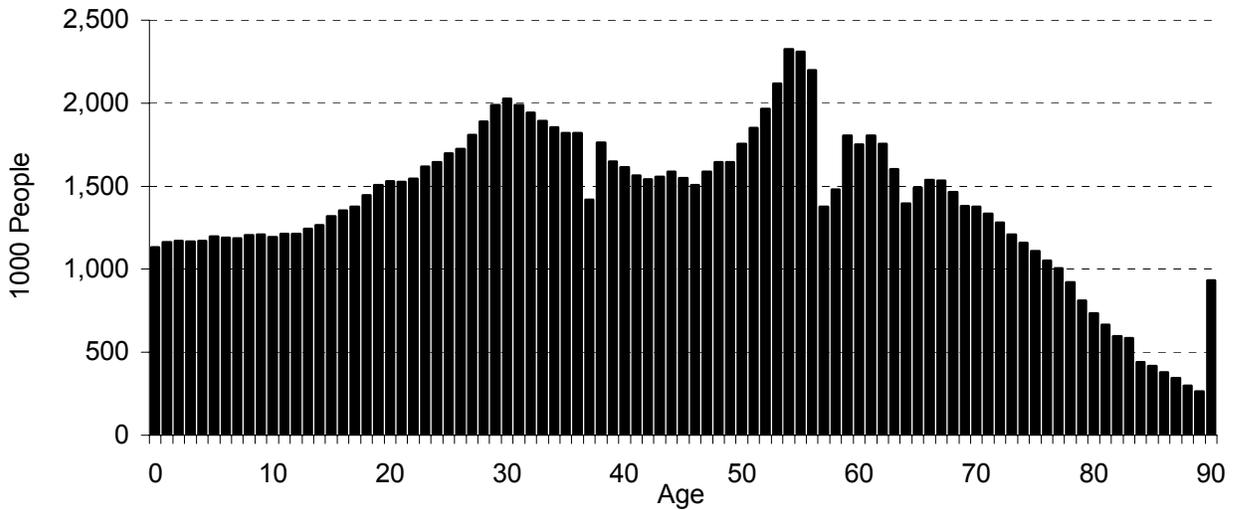
**Figure 4-5. Pulp Exports to Japan by Country**  
 (Source: Japan Customs Statistic)

## 5.0 DEMOGRAPHIC TRENDS IN JAPAN

The Japanese population is aging and birth rates are down. This is leading to an aging society that will soon place heavy burdens on Japan's welfare and government pension system. However, Japanese senior citizens have a high disposable income and spend a larger portion of their income on housing repairs and remodeling than the general population.

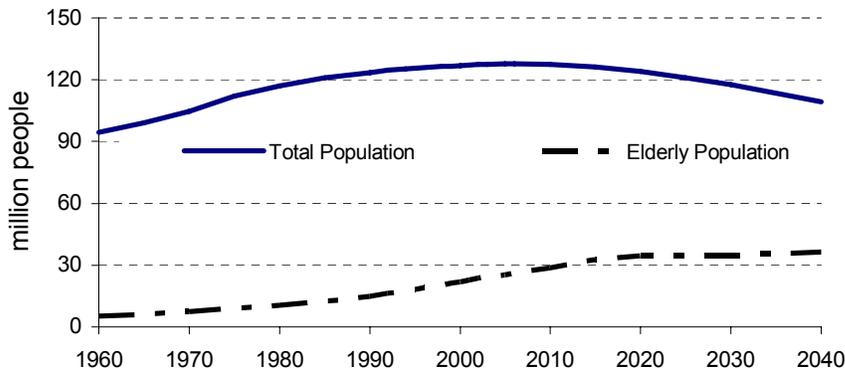
### 5.1 POPULATION DEMOGRAPHIC

Demographic trends are the foundation of predicting the future of Japan's residential construction market. The Japanese population was 127.6 million in 2003, with a large percentage between the ages of 50 and 60 (Figure 5-1). Japan's low population growth of 0.14 percent in 2003 can be attributed to longer life spans and historically low birth rates. In the first half of 2005, the number of deaths exceeded the number of births (MHLW 2005). The net result is that the Japanese population is predicted to decrease to the 1965 population level of around 100 million by 2050.



**Figure 5-1. 2003 Japanese Population Age Distribution**  
 \* 90 and over are aggregated in one category

(Source: Japan Statistic Bureau)



**Figure 5-2. Estimation Trend of Japanese Total and Elderly Population**  
 \* Elderly is 65 years old or over

(Source: National Institute of Population and Social Security Research)

While Japan's total population growth is stagnant, the percentage of population over 65 is growing rapidly (Figure 5-2). This figure was 19.9 percent in 2005 and Japan will soon overtake Italy as the oldest country among the developed countries. One trend pushing Japan towards an elderly society is the aging baby boomers. As with other World War II nations, a large segment of Japan's population is composed of baby boomers. This population segment will start to retire in 2007-2010 and this will increase the burden of the working population supporting the retired population (Cabinet Office 2005). Other countries can reduce this burden by increasing immigration. However, Japan's immigration policies are extremely restrictive and population growth through immigrations is minimal. Therefore, Japan's dependency ratio (defined as the population above 65 divided by the population aged 15 to 64) will soon increase rapidly as the baby boomers retire (Table 5-1). According to the Japan Statistics Bureau, the dependency ratio was 28.5 percent in 2003 and is projected to reach 50 percent by 2030. As Japan's dependency ratio increases, so do the fiscal burdens of increased social security costs, nationalized health care costs, and a shrinking tax base. Furthermore, the labor supply needed to produce goods and services will shrink.

**Table 5-1. Population Change Prediction by Age Distribution**

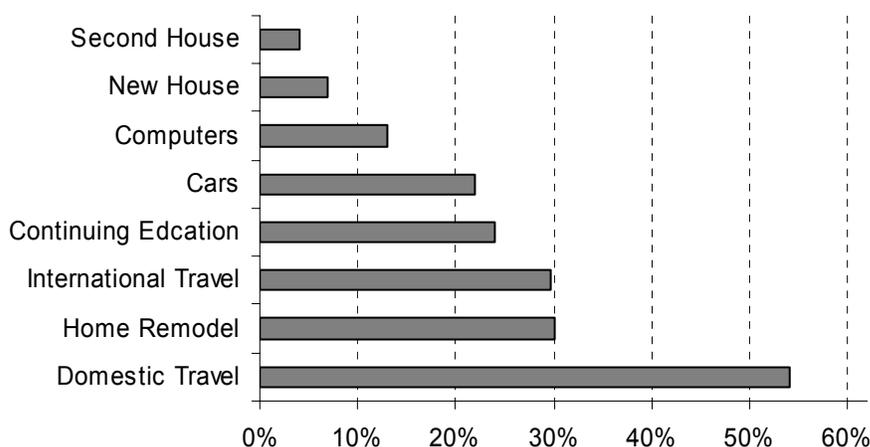
	1990	2000	2010e	2020e	2030e
<b>0 – 4</b>	6,493	5,904	5,393	4,682	4,176
<b>5 – 9</b>	7,467	6,022	5,776	5,022	4,372
<b>10-14</b>	8,527	6,547	5,905	5,391	4,685
<b>15-19</b>	10,007	7,488	6,059	5,808	5,057
<b>20-24</b>	8,800	8,421	6,641	6,016	5,513
<b>25-29</b>	8,071	9,790	7,658	6,282	6,051
<b>30-34</b>	7,788	8,777	8,571	6,837	6,234
<b>35-39</b>	9,004	8,115	9,826	7,716	6,360
<b>40-44</b>	10,658	7,800	8,739	8,533	6,821
<b>45-49</b>	9,018	8,916	8,024	9,709	7,634
<b>50-54</b>	8,088	10,442	7,629	8,550	8,355
<b>55-59</b>	7,725	8,734	8,598	7,745	9,390
<b>60-64</b>	6,745	7,736	9,920	7,257	8,162
<b>65-69</b>	5,104	7,106	8,085	7,996	7,246
<b>70-74</b>	3,818	5,901	6,857	8,896	6,552
<b>75-79</b>	3,018	4,151	5,852	6,771	6,791
<b>80-84</b>	1,833	2,615	4,239	5,078	6,792
<b>85-89</b>	833	1,532	2,365	3,460	4,152
<b>over 90</b>	289	701	1,336	2,357	3,236
<b>Total</b>	123,285	126,697	127,473	124,107	117,580
<b>Dependency Ratio</b>	17.3	25.5	35.2	46.4	50.0

\* Unit = 1000

(Source: National Institute of Population and Social Security Research)

## 5.2 SENIOR CITIZEN MARKET

Generally, Japanese retire at 60 and receive a lump-sum retirement allowance from their employer. During 2004, according to Nippon Keidanren (2005), 13.5 percent of companies give only a lump-sum retirement allowance, 72.3 percent of companies give a lump-sum retirement allowance plus a retirement annuity, and 7.1 percent of companies give only a retirement annuity. Managers with a college degree receive 21.54 million (US\$ 199,000<sup>1</sup>) yen, high-school graduates in management receive 19.59 million yen (US\$ 181,000<sup>1</sup>), and high-school graduate workers get 18.53 million yen (US\$ 171,000<sup>1</sup>) as their average retirement lump-sum allowance (Nippon Keidanren 2005). In addition to company pensions, Japanese citizens over 65 receive monthly social security payments. The estimate for Japanese baby boomers retiring after 2007 is more than 2.7 million and more than 50 trillion yen (US\$ 462 billion<sup>1</sup>) is predicted to be paid out to these retirees in retirement benefits (JLJ 2005c). According to a survey summarized in the Nikkei Weekly regarding baby boomer retirement spending intentions (2003), 30 percent plan to spend money on remodeling, seven percent plan to buy a new primary residence, and about four percent plan to buy a secondary residence (Figure 5-3).



**Figure 5-3. Baby Boomers Spending Plans after Retirement**

(Source: The Nikkei Weekly 2003)

The average annual per capita income of Japanese over 60 years of age is 1.96 million yen (US\$ 18,100<sup>2</sup>) and is only slightly lower than the Japan's average annual per capita income of 2.05 million yen (US\$ 18,900<sup>1</sup>). The average annual household income of elderly (defined as the major income earner being 65 or older) is 3.05 million yen (US\$ 28,000<sup>1</sup>) of which 67 percent comes from government pensions. Additionally, Japanese elderly households have a large amount of savings. In 2003, the average savings among elderly households was 24.2 million yen (US\$ 224,000<sup>1</sup>), which is 1.4 times more than the average savings of Japanese total households. Seventeen percent of Japanese households, where the main income earner is over 65, have more than 40 million yen (US\$ 370,000<sup>1</sup>) in savings (Cabinet Office 2005).

On the monthly income side, elderly households, where the head of household is still working, receive an average of 366,000 yen (US\$ 3,380<sup>1</sup>) per month. Elderly households where the head of the household is not working receive, 184,000 yen (US\$ 1,700<sup>1</sup>) per month (Table 5-2). On the monthly expense side, the amount of money spent on home repair and remodeling is three times greater for elderly households than for the 40 to 49 year old households (Table 5-3). Also, over-60 households spend more money on interior furnishing and decoration than under-60 households. This figure illustrates the fact that, as the Japanese population ages, the amount they spend on their home increases dramatically.

<sup>1</sup> US\$1 = 108.2 yen (2004)

<sup>2</sup> US\$1 = 108.2 yen (2004)

**Table 5-2. Mean Monthly Household Income where the Head of Household is over 60**

	<b>Workers</b>	<b>Non-workers</b>
<b>Number of Members in Household</b>	2.4	1.9
<b>Average Age</b>	64.2	71.3
<b>Percentage of house ownership (%)</b>	79.2	83.5
<b>Total monthly Receipts (unit = yen)</b>	776,095	527,373
<b>Total monthly income</b>	366,352	183,966
<b>Social Security Benefits</b>	79,045	159,543
<b>Spouse's income</b>	21,126	4,515
<b>Other income</b>	675,924	363,315

(Source: Japan Statistic Bureau)

**Table 5-3. Mean Monthly Expenses by Age of the Head of Household in 2004**

	<b>under 29</b>	<b>30-39</b>	<b>40-49</b>	<b>50-59</b>	<b>60-64</b>	<b>65-69</b>	<b>over 70</b>
<b>Percentage of total households (%)</b>	3.0	15.6	20.1	23.2	11.6	10.8	15.6
<b>Percentage of house ownership (%)</b>	19.9	49.1	72.8	85.4	88.4	88.2	89.8
<b>Total monthly living expenses (unit = yen)</b>	253,210	281,210	343,972	352,612	293,624	270,809	245,561
<b>Food</b>	47,069	60,777	77,694	78,561	70,743	68,468	62,310
<b>Total housing expenses</b>	40,385	28,345	17,210	14,011	19,359	16,543	19,609
<b>Rents for dwelling &amp; land</b>	38,023	25,665	12,939	7,174	5,699	5,643	4,545
<b>Repairs &amp; maintenance</b>	2,361	2,680	4,271	6,837	13,660	10,900	15,064
<b>Fuel, light &amp; water charges</b>	14,952	18,322	22,501	23,262	21,120	20,522	19,765
<b>Total furniture and household utensils</b>	8,844	9,293	10,017	11,110	10,228	9,503	9,182
<b>Household durables</b>	2,992	2,847	3,210	3,579	3,280	2,873	2,993
<b>Interior furnishings &amp; decorations</b>	624	903	738	1,002	899	1,127	1,124
<b>Bedding</b>	1,117	686	689	874	905	683	647
<b>Domestic utensils</b>	2,102	2,238	2,119	2,191	2,040	1,860	1,466
<b>Domestic non-durable goods</b>	1,693	2,036	2,378	2,325	2,049	1,938	1,771
<b>Domestic services</b>	315	583	883	1,137	1,055	1,021	7,180
<b>Clothes &amp; footwear</b>	11,004	13,339	16,389	16,162	12,792	11,367	8,956
<b>Medical care</b>	9,702	9,987	11,344	11,478	13,731	15,180	13,981
<b>Transportation &amp; communication</b>	46,762	44,706	47,817	46,247	33,275	30,855	21,450
<b>Education</b>	4,221	12,204	33,329	18,403	2,044	1,690	1,091
<b>Reading &amp; recreation</b>	22,894	31,939	38,091	30,783	30,875	30,110	25,276
<b>Other living expenditure</b>	47,376	52,298	69,579	102,595	79,456	66,570	63,940

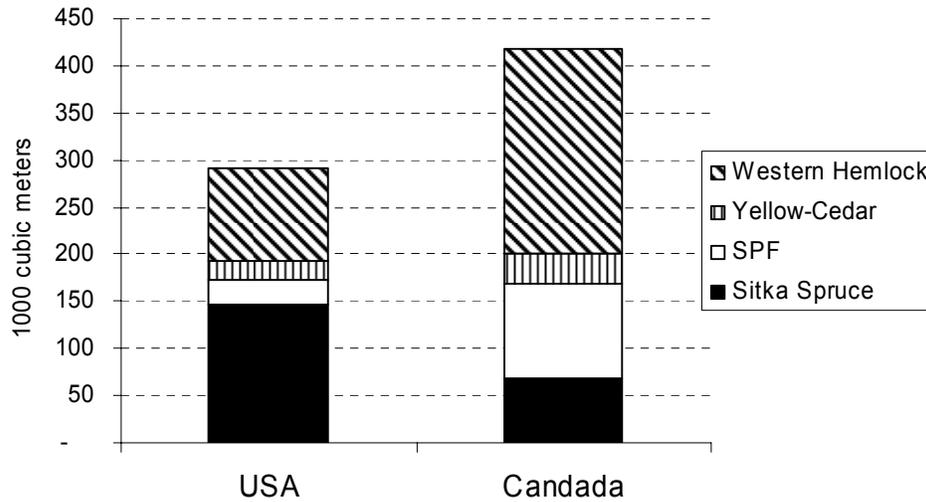
(Source: Japan Statistic Bureau)

## 6.0 JAPANESE LUMBER AND LOG IMPORT DATA FROM THE U.S.

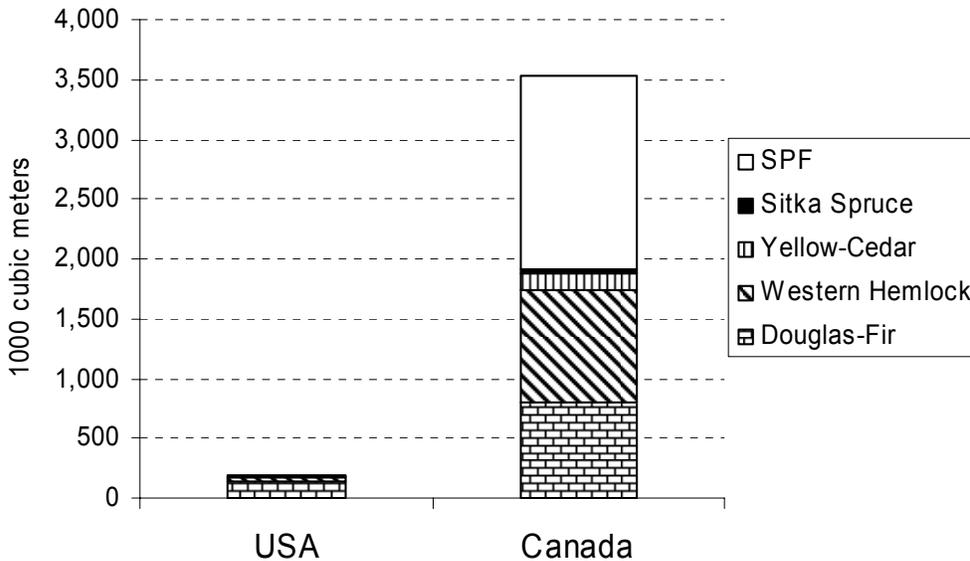
U.S. logs and lumber exports to Japan have significantly decreased since the early 1990's due to a variety of factors including constrained supply, strong U.S. housing demand, increased global competition, and a strong U.S. Dollar.

### 6.1 HISTORICAL TRENDS

Annual log imports from the U.S. and Canada averaged approximately 10 million m<sup>3</sup> from 1970-1989. This figure is a sharp contrast to 3.6 million m<sup>3</sup> imported from the U.S. and Canada in 2004. Of this figure, the U.S. exported 2.6 million m<sup>3</sup> and Canada exported 1.0 million m<sup>3</sup> in 2004. Douglas-fir is the main species of logs imported, which accounts for 89 percent and 59 percent of all softwood log imported from the U.S. and Canada, respectively. Figure 6-1 shows the other species of softwood log imported from North America. In contrast to logs, Canada exports more lumber to Japan than the U.S. (Figure 6-2). Planed SPF lumber from Canada is extremely popular among Japan's 2x4 builders. Planed Douglas-fir from the U.S. is popular for structural beams in post and beam houses.

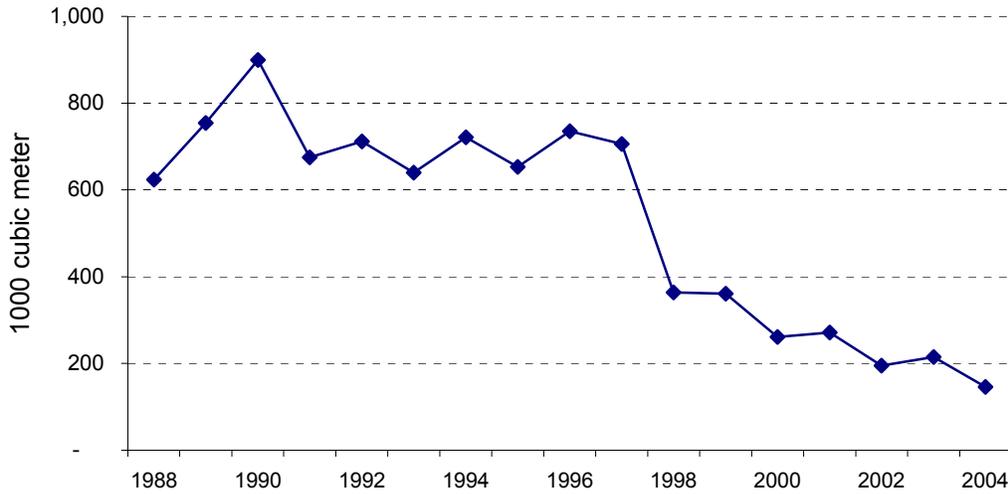


**Figure 6-1. Softwood Log (Excluding Douglas-Fir) Imports from the U.S. and Canada in 2004**  
(Source: The Ministry of Finance and the Customs)

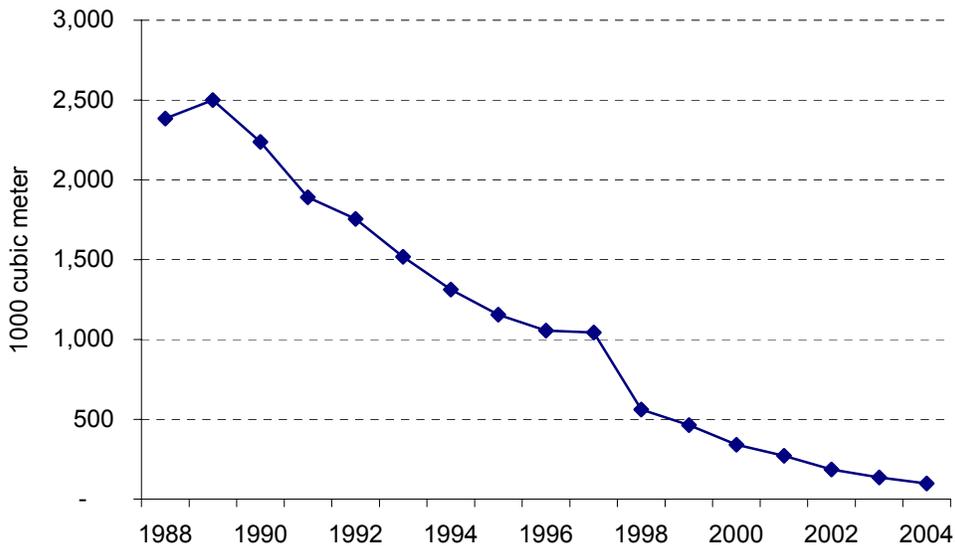


**Figure 6-2. Softwood Lumber Imports from the U.S. and Canada in 2004**  
(Source: The Ministry of Finance and the Customs)

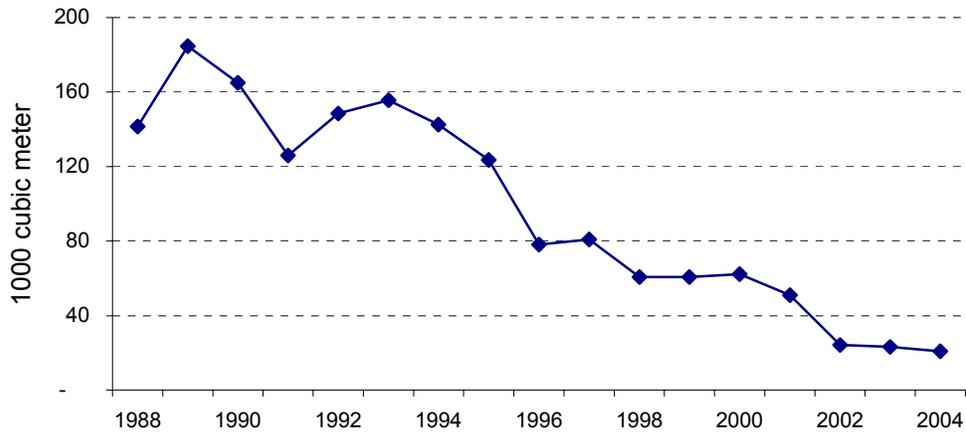
The U.S. exported 900,000 m<sup>3</sup> of Sitka spruce logs in 1990. However, this volume declined to 146,000 m<sup>3</sup> by 2004 (Figure 6-3). U.S. hemlock log exports to Japan were only 97,000 m<sup>3</sup> in 2004, down from 2.5 million in 1989 (Figure 6-4). White and yellow-cedar log exports from the U.S. to Japan declined from 185,000 m<sup>3</sup> in 1989 to 21,000 m<sup>3</sup> in 2004 (Figure 6-5). U.S. SPF log exports (Figure 6-6) and U.S. Western red-cedar exports also declined (Figure 6-7). Even U.S. Douglas-fir log exports, which were 6.7 million m<sup>3</sup> in 1989, dropped to 2.3 million m<sup>3</sup> in 2004 (Figure 6-8). While U.S. log exports to Japan have been decreasing (Figure 6-9), Canada log exports to Japan have been increasing since 1997 due to a loosening of Canada's log export restrictions (Figure 6-10).



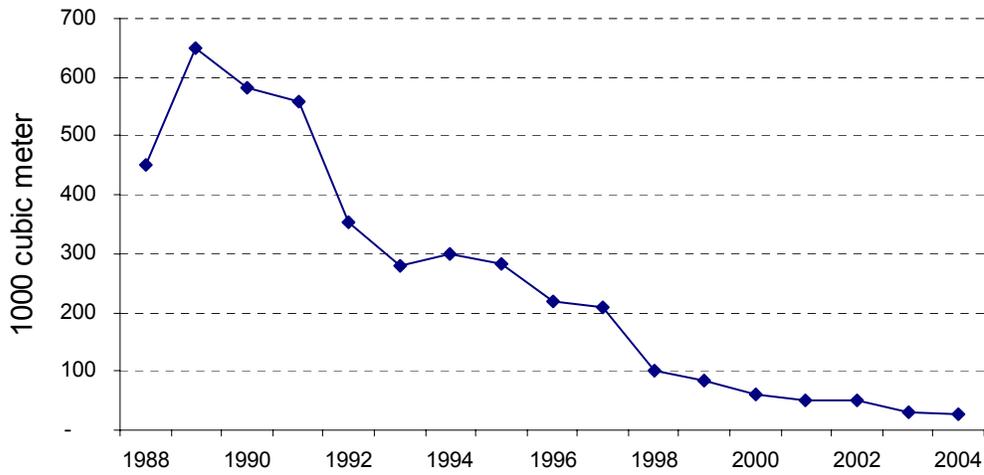
**Figure 6-3. U.S. Sitka Spruce Log Exports to Japan**  
(Source: The Ministry of Finance and the Customs)



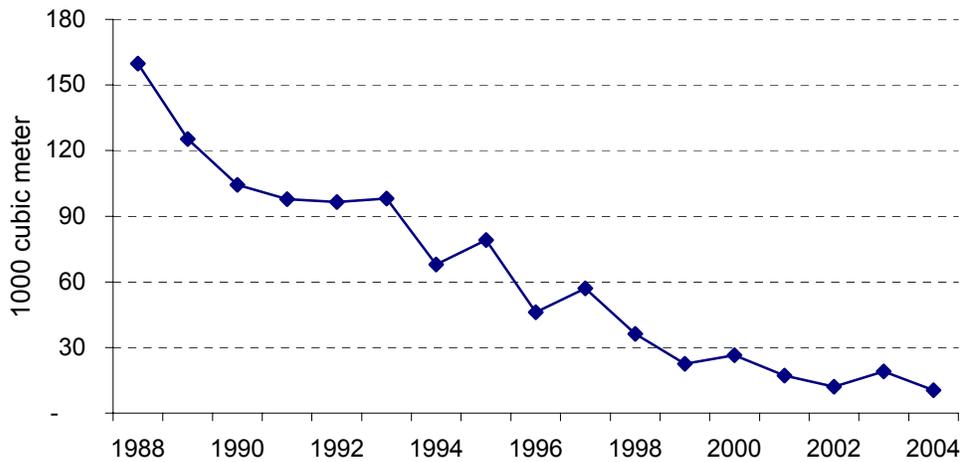
**Figure 6-4. U.S. Hemlock Log Exports to Japan**  
(Source: The Ministry of Finance and the Customs)



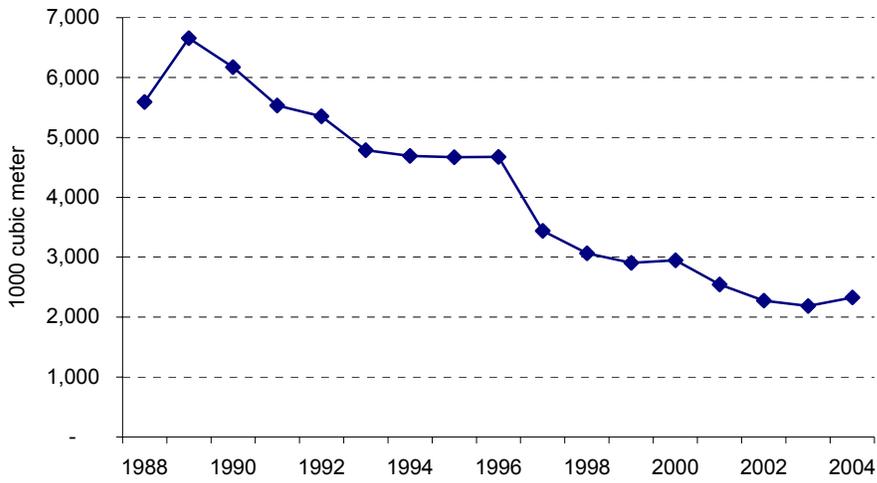
**Figure 6-5. U.S. White and Yellow-Cedar Log Exports to Japan**  
 (Source: The Ministry of Finance and the Customs)



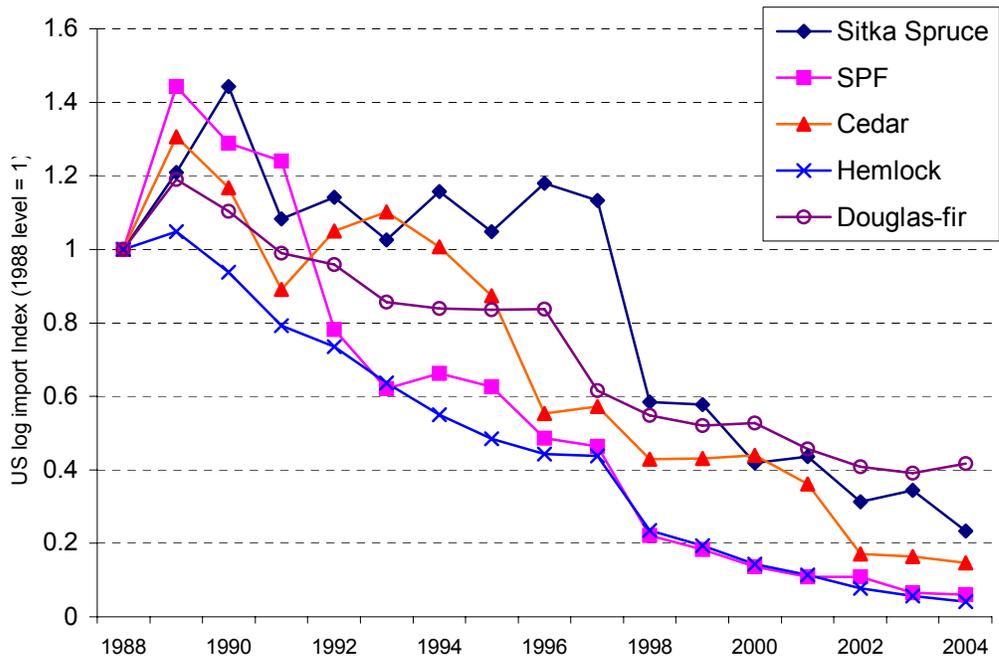
**Figure 6-6. U.S. Spruce, Pine and Fir (SPF) Log Exports to Japan**  
 (Source: The Ministry of Finance and the Customs)



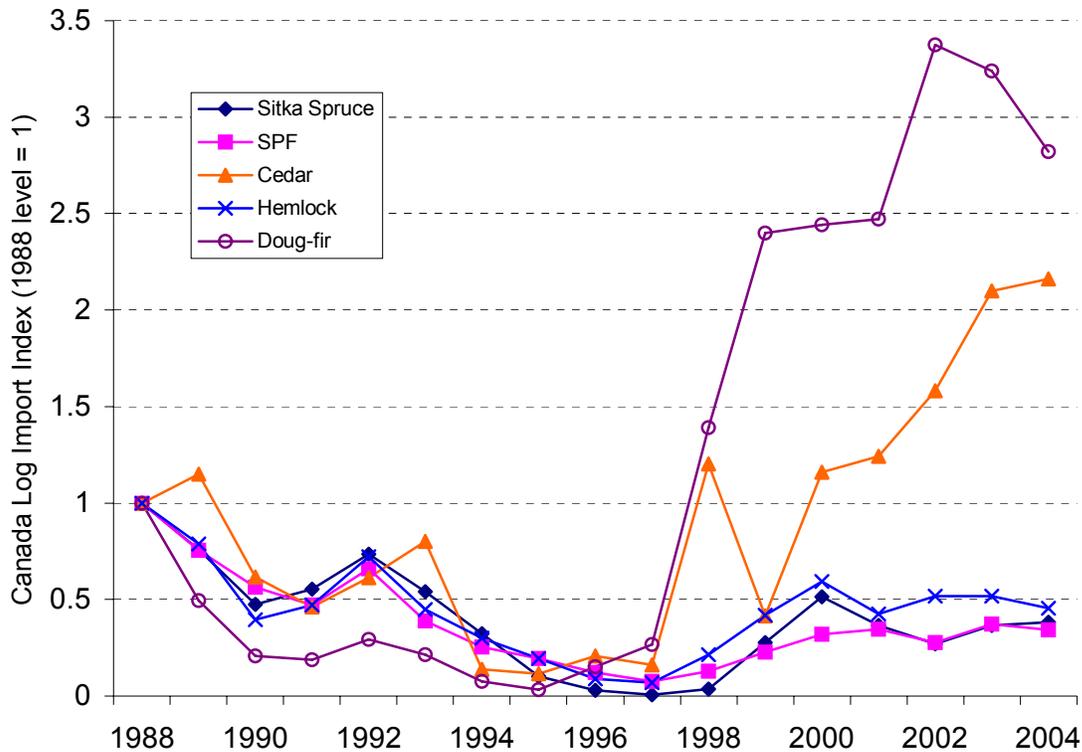
**Figure 6-7. U.S. Western Red-Cedar Log Exports to Japan**  
 (Source: The Ministry of Finance and the Customs)



**Figure 6-8. U.S. Douglas-Fir Log Exports to Japan**  
 (Source: The Ministry of Finance and the Customs)



**Figure 6-9. Index of U.S. Log Exports to Japan**  
 \* 1988 level = 1.  
 (Source: The Ministry of Finance and the Customs)



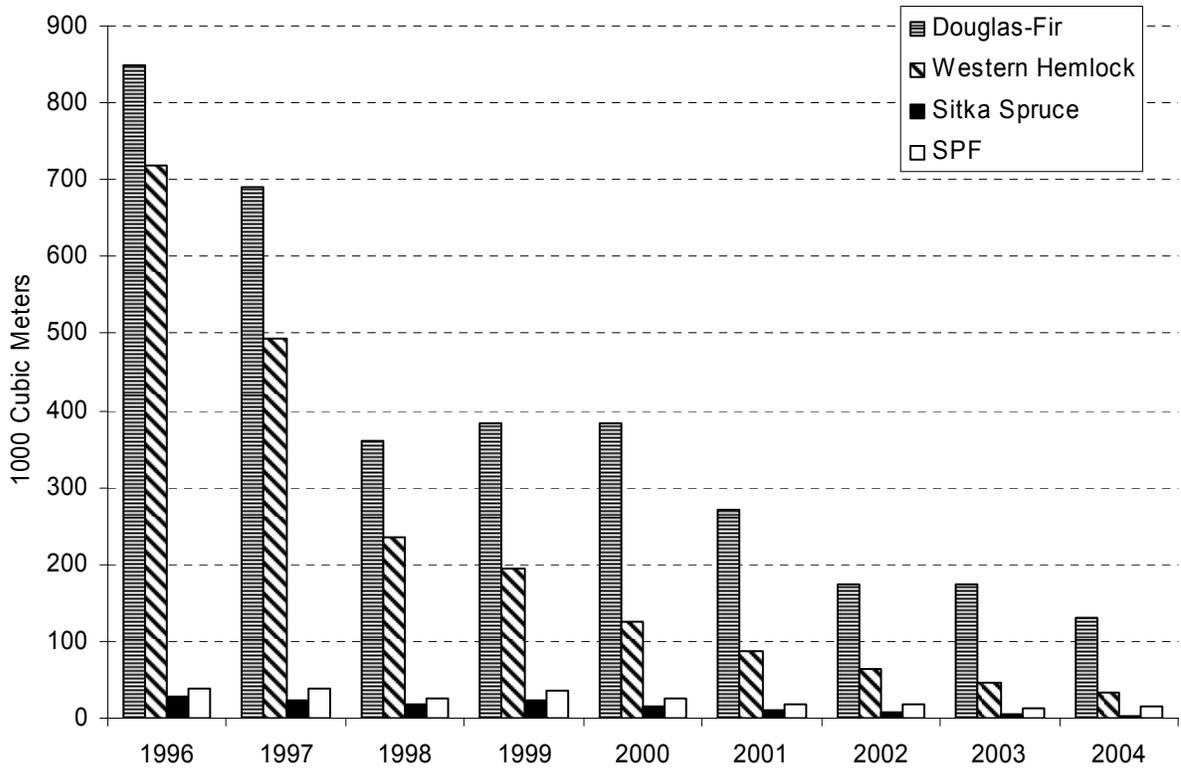
**Figure 6-10. Index of Canada Log Exports to Japan**

\* 1988 level = 1.

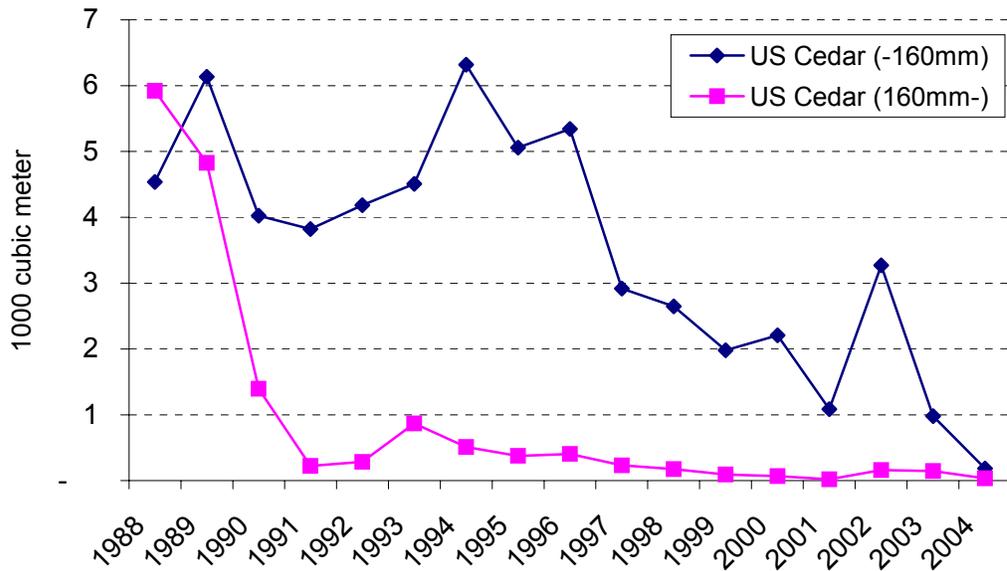
(Source: The Ministry of Finance and the Customs)

There are many reasons why the U.S. lost market share in Japan during the 1990's. First, the listing of the Northern spotted owl as an endangered species in 1990 constrained supply. Second, strong U.S. housing starts absorbed much of the U.S. supply and kept prices firm. Third, during the 1990's, the U.S. economy had strong economic growth, while the Japanese economy stagnated. This disparity pushed the U.S. Dollar up against the Japanese yen making U.S. forest products relatively more expensive than other countries. Fourth, European forest products entered the market and supplanted many North American products. The Europeans have been extremely successful at defining the needs of the Japanese market and providing products that meet these needs.

U.S. lumber exports to Japan have also decreased (Figure 6-11). U.S. white and yellow-cedar lumber export quantities are relatively small and so these are broken out in a separate graph (Figure 6-12).



**Figure 6-11. U.S. Lumber Exports to Japan**  
 (Source: The Ministry of Finance and the Customs)



**Figure 6-12. U.S. White and Yellow-Cedar Lumber Exports to Japan**  
 (Source: The Ministry of Finance and the Customs)

## 6.2 FUTURE PROJECTIONS FOR ALASKA EXPORTS TO JAPAN

### Log

To predict the future log exports from Alaska to Japan, the historical volume of log export statistics by species from the Anchorage Customs District (Warren 2005) was utilized (Table 6-1). The Anchorage Customs District data includes all exports out of Alaska. This data uses volume in Scribner scale board feet. However, this data does not include a category for Alaska yellow-cedar export volume, which is included in the “other softwoods” category. Therefore, Alaska yellow-cedar data was estimated using Japan Lumber Import Association (JLIA) cubic meter volume data through 2002, which is the last year it was compiled (Table 6-2).

**Table 6-1. Board Foot Volume of Softwood Log Exports from Anchorage Customs District to Japan**

	<b>Total BDFT</b>	<b>Western hemlock</b>	<b>Sitka Spruce</b>	<b>Western Red-Cedar</b>	<b>Other Softwoods (Including AYC)</b>
<b>1991</b>	364,987	137,515	182,066	19,836	25,570
<b>1992</b>	354,398	116,016	174,459	21,936	41,987
<b>1993</b>	379,234	119,343	189,109	25,690	45,092
<b>1994</b>	396,290	116,970	213,207	23,994	42,119
<b>1995</b>	356,928	116,903	189,840	18,880	31,305
<b>1996</b>	383,056	129,788	218,545	13,042	21,681
<b>1997</b>	351,497	114,246	194,755	20,198	22,298
<b>1998</b>	161,369	45,034	97,351	6,402	12,582
<b>1999</b>	257,472	78,738	124,811	8,657	45,266
<b>2000</b>	201,753	69,045	100,628	11,407	20,673
<b>2001</b>	149,923	49,441	81,800	4,359	14,323
<b>2002</b>	108,822	37,511	58,572	4,172	8,567
<b>2003</b>	120,113	37,524	65,319	7,816	9,454
<b>2004</b>	75,206	20,927	45,565	3,090	5,624

(unit = 1000 BF)

(Source: Warren 2005)

**Table 6-2. Cubic Meter Volume of Softwood Log by Species Percentage from Alaska**

	<b>Total (m<sup>3</sup>)</b>	<b>Western Hemlock</b>	<b>Sitka Spruce</b>	<b>Western Red-Cedar</b>	<b>Alaska Yellow-Cedar</b>	<b>Other Softwoods</b>
<b>1991</b>	1,313,123	34.1%	54.4%	4.9%	6.5%	0.1%
<b>1992</b>	1,277,082	30.7%	54.2%	5.6%	9.5%	0.0%
<b>1993</b>	1,195,052	30.5%	52.8%	6.1%	10.3%	0.2%
<b>1994</b>	1,220,904	27.4%	57.4%	5.2%	10.0%	0.0%
<b>1995</b>	1,203,621	28.4%	57.4%	5.5%	8.7%	0.0%
<b>1996</b>	1,234,246	30.9%	61.2%	3.2%	4.6%	0.0%
<b>1997</b>	1,140,633	30.0%	60.2%	4.5%	5.2%	0.1%
<b>1998</b>	675,979	31.7%	55.8%	4.4%	7.9%	0.2%
<b>1999</b>	604,240	32.6%	55.9%	3.3%	8.2%	-
<b>2000</b>	559,108	36.0%	47.3%	5.3%	11.4%	-
<b>2001</b>	473,864	32.8%	56.1%	3.1%	7.9%	-
<b>2002</b>	311,407	35.0%	53.9%	3.8%	7.3%	-

(Source: JLIA)

We assume the “other softwoods” category in the Anchorage Customs District data in Table 6-1 is all Alaska yellow-cedar because Table 6-2 shows that “other softwoods” (not including Western hemlock, Sitka spruce, Western red-cedar and Alaska yellow-cedar) being imported into Japan from Alaska is close to zero. Unlike lumber, most logs shipped out of Alaska leave via Alaska ports and are not trans-shipped through Washington State ports (Stevens 2006).

2005 are estimates based on Japan’s customs clearance monthly data through November 2005. These projections are based on the information in this paper. The authors did not use a forecasting model, but rather made general assumptions based on Japanese economic data and a long term reduction in housing starts (Table 3-1 and 3-2). We assume that the export volume will be constant over the next ten years from 2006 through 2015 as economic recovery is offset by housing start declines. Then, we project that volumes will decrease from 2016 through 2025 by ten percent as population declines lead to a further decrease in housing starts (Table 6-3).

**Table 6-3. Future Projections for Alaska Logs Exports to Japan**

	<b>Total BDFT</b>	<b>Western Hemlock</b>	<b>Sitka Spruce</b>	<b>Western Red-Cedar</b>	<b>Alaska Yellow-Cedar</b>
<b>1999</b>	257,472	78,738	124,811	8,657	45,266
<b>2000</b>	201,753	69,045	100,628	11,407	20,673
<b>2001</b>	149,923	49,441	81,800	4,359	14,323
<b>2002</b>	108,822	37,511	58,572	4,172	8,567
<b>2003</b>	120,113	37,524	65,319	7,816	9,454
<b>2004</b>	75,206	20,927	45,565	3,090	5,624
<b>2005e</b>	72,643	15,875	44,604	2,344	9,820
<b>2006-2015e</b>	72,643	15,875	44,604	2,344	9,820
<b>2016-2025e</b>	65,379	14,288	40,143	2,110	8,838

(unit = 1000 BF)

**Lumber**

To predict the future Alaska lumber exports to Japan, the historical volume of export statistics from the Anchorage Customs District (Warren 2005) and import statistics from JLIA data were both utilized. After the pulp mills in Sitka and Ketchikan closed in 1993 and 1997 respectively, the volume of lumber exported directly to Japan from Alaska significantly decreased. The volume in 2004 was only about one percent of the 1991 level (Table 6-4). Recent statistics show that Japan imports only Sitka spruce lumber from Alaska (Table 6-5). Also, some lumber from Southeast Alaska is barged down to Seattle and shipped to Japan. This quantity does not show up in Anchorage Customs District data and must be estimated.

**Table 6-4. Board Foot Volume of Softwood Lumber Exports from Anchorage Customs District to Japan**

	<b>Total BDFT</b>	<b>Western Hemlock</b>	<b>Sitka Spruce</b>	<b>Western Red-Cedar</b>	<b>Other Softwoods</b>
<b>1991</b>	161,649	90,749	66,072	2,863	1,965
<b>1992</b>	127,540	78,222	46,372	575	2,371
<b>1993</b>	143,557	92,075	50,915	-	567
<b>1994</b>	107,166	66,958	39,952	-	256
<b>1995</b>	49,351	28,019	19,672	1,407	253
<b>1996</b>	26,784	14,761	11,934	20	69
<b>1997</b>	30,238	17,364	12,246	-	628
<b>1998</b>	8,105	3,856	3,791	-	458
<b>1999</b>	14,370	1,492	8,388	-	4,490
<b>2000</b>	3,161	-	3,161	-	-
<b>2001</b>	3,247	-	3,247	-	-
<b>2002</b>	-	-	-	-	-
<b>2003</b>	1,217	-	1,217	-	-
<b>2004</b>	1,825	-	1,825	-	-

(unit = 1000 BF)

(Source: Warren 2005)

**Table 6-5. Cubic Meter Volume of Softwood Lumber Imports from Alaska by Species Percentage**

	<b>Total (m<sup>3</sup>)</b>	<b>Western Hemlock</b>	<b>Sitka Spruce</b>	<b>Alaska Yellow-Cedar</b>	<b>Other Softwoods</b>
<b>1991</b>	359,203	62.1%	34.6%	1.9%	1.4%
<b>1992</b>	303,706	54.6%	45.0%	0.4%	-
<b>1993</b>	305,167	63.4%	36.6%	-	-
<b>1994</b>	252,707	64.2%	35.8%	-	-
<b>1995</b>	126,315	48.9%	51.0%	0.1%	-
<b>1996</b>	61,503	58.9%	40.7%	0.5%	-
<b>1997</b>	54,646	70.2%	29.8%	-	-
<b>1998</b>	24,799	49.6%	50.4%	-	-
<b>1999</b>	21,817	25.9%	74.1%	-	-
<b>2000</b>	116	-	100%	-	-
<b>2001</b>	856	-	100%	-	-
<b>2002</b>	0	-	-	-	-

(Source: JLIA)

For the reasons explained above, we combine Warren (2005) data with Japan's customs clearance data to adjust projections even though it does not include the data by states. The conversion factor from cubic meter to board feet is 0.00236 ( $1\text{m}^3 = 424 \text{ bdf}$ ) for lumber (Howard 2001). 2005 are estimates based on customs clearance monthly data through November 2005.

Table 6-7 is the projection based on current harvest levels and Alaska forest products promotion in Japan. These projections could be increased if the harvest level and or Japan Alaska forest products promotion activity increases. We assume that the export volume will be constant over the next ten years from 2006 through 2015. Then, we project that volumes will decrease from 2016 through 2025 by ten percent due to population declines for the reasons discussed above.

### **Woodchips**

Woodchip export data from Alaska to Japan is listed in Table 6-7. This data includes both softwood and hardwood chips. 2005 is estimates based on monthly data though August. We assume that the export volume will be constant over the next ten years from 2006 through 2015. Then, we project that volumes will decrease from 2016 through 2025 by ten percent due to population declines and the consumption would drop.

**Table 6-6. Future Projections for Alaska Lumber Exports to Japan**

	Total (BDFT)		Western Hemlock		Sitka Spruce		Alaska Yellow-Cedar		Western Red-Cedar
	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
<b>1999</b>	73,531	14,370	57,483	1,492	8,863	8,388	7,185	-	-
<b>2000</b>	43,485	3,161	37,403	-	4,502	3,161	1,581	-	-
<b>2001</b>	30,673	3,247	25,545	-	3,505	3,247	1,624	-	-
<b>2002</b>	20,339	-	19,248	-	1,091	-	-	-	-
<b>2003</b>	15,609	1,217	13,598	-	1,403	1,217	609	-	-
<b>2004</b>	12,939	1,825	10,201	-	1,825	1,825	913	-	-
<b>2005e</b>	7,859	-	5,632	-	1,674	1,674	553	-	-
<b>2006-2015e</b>	7,859	-	5,632	-	1,674	1,674	553	-	-
<b>2016-2025e</b>	7,073	-	5,069	-	1,506	1,506	498	-	-

\* Total includes both direct exports from the Anchorage Customs District to Japan and the estimation of barging to other ports from Alaska and then export to Japan.

**Table 6-7. Dry Volume of Wood Chip Exports from Alaska to Japan**

	2000	2001	2002	2003	2004	2005e	2006-2015e	2016-2025e
<b>Wood Chip</b>	12,478	53,010	63,174	81,096	21,725	16,649	16,649	14,984

(unit = metric tons)

(Source: USDA Foreign Agriculture Service)

## 7.0 OPPORTUNITIES FOR ALASKA FOREST PRODUCTS EXPORTERS

As of mid-2005, Japan's economic indicators show a strong economic recovery, which should lead to increased forest products consumption in Japan. The authors recommend the following markets for Alaska forest products manufacturers to target:

### 1. Power builder market

This is a growing market segment in Japan and these companies are large enough to import Alaska forest products in large quantities. However, Alaska must be able to offer a steady and constant supply of forest products.

### 2. Kiln dried lumber

Alaska has substantially increased its kiln-dried lumber capacity recently. Japan's ten year warranty building requirement has increased demand for kiln dried lumber. There is ample demand for kiln dried lumber in both the 2x4 and post and beam housing market. See Appendix D for post and beam lumber dimensions.

### 3. Lamstock market

There has been an increase in demand for engineered wood and the number of Japanese glulam manufacturers. The results of the Ketchikan Wood Technology Center Alaska species testing program have shown Alaska lumber has superior strength properties compared with many other species. Japanese glulam manufacturers could use Alaska species as lamstock to produce a superior strength glulams product.

### 4. Pre-cut lumber market

Almost 75 percent of Japanese post and beam starts used pre-cut lumber. Japan's pre-cut lumber mills are a strong market to target with blanks that could be used with their pre-cut lumber machines. The blank sizes vary based on the application.

### 5. Alaska yellow-cedar for sill plate (*dodai*)

Due to its natural decay resistant properties, Alaska yellow-cedar is very popular for sill plates in Japan.

### 6. Alaska yellow-cedar for garden accessories and soaking tubs

Alaska yellow-cedar's decay resistant properties make it an excellent species for outdoor garden accessories such as benches, gazebos, and lattice. As explained earlier, there are a lot of retirees in Japan and this number will be increasing. Many retirees spend more time in their gardens and the demand for garden accessories will increase.

Also, Alaska yellow-cedar is considered a substitute for *hinoki*, (Japanese falsecypress). Japanese people traditionally take a bath daily. Soaking tubs are especially popular in Japan and most detached houses have one (see Appendix H). An Alaska yellow-cedar tub could be developed and positioned as an upscale alternative to a *hinoki* tub.

### 7. Home improvement market for retirees

Japan's baby boomers are approaching retirement age. As presented earlier, many Japanese retiring workers receive a large lump sum payment, which they often use to improve their house. The senior home improvement market is expected to grow exponentially once baby boomers start to retire.

### 8. Remodel market

The remodeling market is expanding. There is an opportunity for producers to collaborate with remodelers, architects, and designers to develop higher quality products to sell to Japan. Also, D.I.Y. retailers can be potential distributors for Alaska forest products.

### 9. Wood Chips

It has been estimated that over 2.3 million acres of timber have been affected in the Kenai Peninsula by the spruce bark beetle. Japan has one of the largest paper markets in the world. Furthermore, imported chips and pulp are

increasing in Japan. Recently, paper companies have been avoiding tropical hardwood chips and pulp due to environmental concerns. This may be an opportunity to increase chip exports from Alaska.

#### **10. Gift Market**

Japan's gift market has strong potential for smaller wood products and craft items. Gift giving is a very important Japanese tradition. According to *Fuji Keizai Co.*, the total size of Japan's gift market was 4.41 trillion yen (US\$ 40.8 billion<sup>1</sup>) and 31.5 percent of this (US\$ 12.8 billion<sup>1</sup>) was food (Nikkei 2005b). This market offers tremendous opportunity for smaller wood products that can be packaged and shipped easily. It would also make the gift more attractive if it is bundled with other made in Alaska items.

#### **11. Branding Strategy**

The Ketchikan Wood Technology Center has registered proprietary grademarks for Alaska species. These grademarks are "Alaska Hem", "Alaska Yellow Cedar", and "Alaska Spruce." These three grademarks should be developed into a brand that communicates the quality of Alaska forest products the Japanese forest products industry. In conjunction with the Wood Technology Center, efforts should be made to communicate the quality of these brands through the following methods:

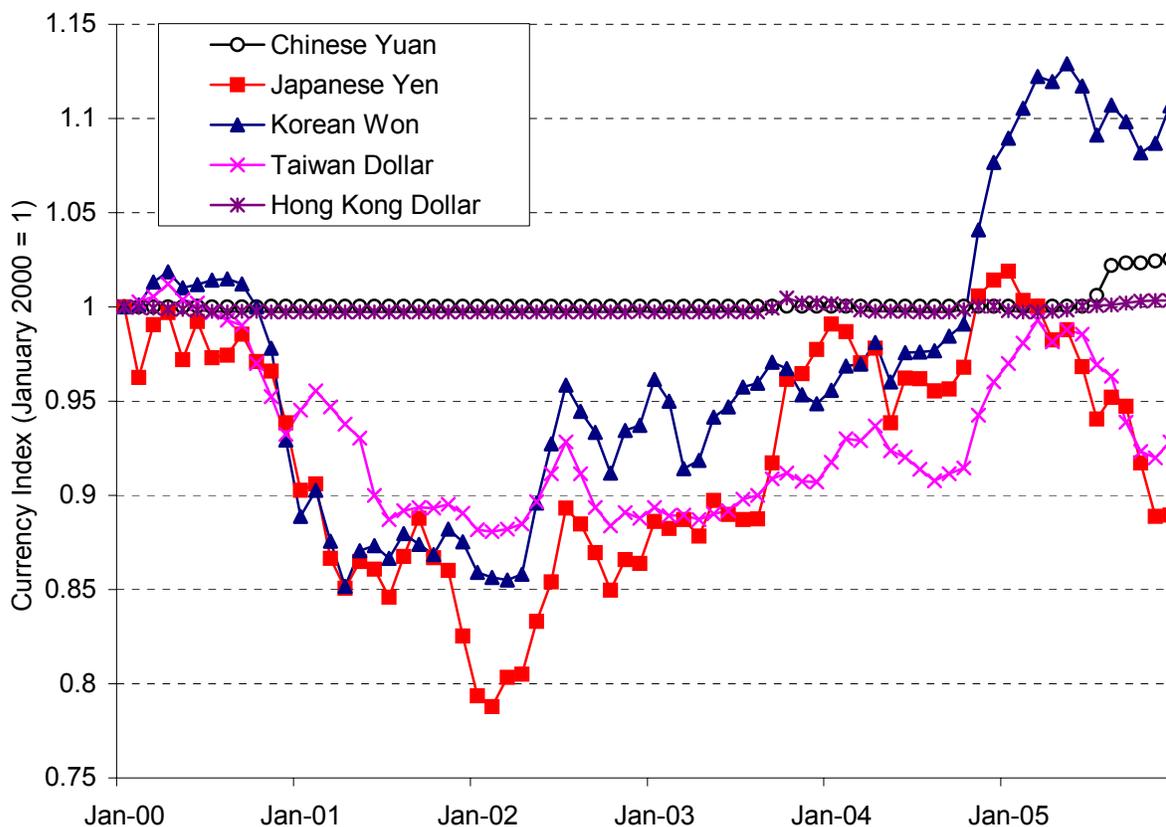
- a. Booths at major tradeshows (see Appendix C).
- b. Japanese promotional literature.
- c. Product samples that can easily be shipped.
- d. Trade missions in conjunction with the state of Alaska department of economic development. Bring Alaska producers to Japan to visit major Japanese lumber buyers.
- e. Bring major buyers of forest products to Alaska for a tour of Alaska and its forest products.
- f. Develop a quality logo and brand name that appeals to the Japanese market.

---

<sup>1</sup> US\$1 = 108.2 yen (2004)

## 8.0 FUTURE RESEARCH

U.S. exporters should research not only Japan but also other East Asian markets. There are several other big developing markets in East Asia, and these markets have different currencies. Figure 8-1 shows the strengthening of the Asian currencies since January 2000. The scales on the Y-axis have been inverted so that as the lines go up the currency is strengthening. The Hong Kong dollar is fixed at a rate of one U.S. Dollar to 7.8 Hong Kong dollars. The Chinese yuan was also pegged 8.28 yuan to one U.S. Dollar until July 21, 2005. The People's Bank of China officially announced that the Chinese yuan would be pegged to a basket of foreign currencies on July 21, 2005, rather than being strictly pegged to the U.S. Dollar and would trade within a narrow 0.3 percent band against this basket of currencies (The People's Bank of China 2005). Since July 21, 2005, the yuan has appreciated 2.2 percent to one U.S. Dollar to 8.11 yuan. From 2000 to the beginning of 2002, the Korean won and Taiwan dollar both weakened against a strong U.S. Dollar. Since then both currencies have strengthened. One U.S. Dollar was 1034.8 Korean won and 31.9 Taiwan dollar on July 18, 2005. The Korean won has strengthened against the U.S. Dollar in 2005. Increasingly, Asian countries have come to rely on the Chinese economy to fuel growth. This is a change from the past, where the focus has been on the Japanese and U.S. economies. Furthermore, due to the acceleration of global trade, China has become a major manufacturing base for the Japanese market. Therefore, future research should focus on China, Korea, and Taiwan and opportunities for Alaskan forest products in these markets. In addition to the economies discussed above, Thailand, Vietnam, and India also offer potential markets. Future research should focus on China and other emerging markets.



**Figure 8-1. East Asian Currency Index Comparison**

- a. Chinese yuan was and Hong Kong Dollar is virtually fixed as U.S. Dollars.
- b. Exchange rate on January 2000 as 1.

(Source: Federal Reserve Bank)

## 9.0 LITERATURE CITED

- Arai, N. 2005. Pre-cut-zai. *Wood Industry*, 59 (11), 551-554.
- Bucksot, S., C. Jensen and D. Tratensek. 2004. Where Are We Headed? 2005 Market Measure the Industry Annual Report. Do-It-Yourself Retailing. 26-39.
- Burton, J. 2005. Singapore sees 'basket, band and crawl' system as template for E Asia. *Financial Times*. (July 23)
- Cabinet Office. 2005. Kourei Syakai Hakusho. Government of Japan. Tokyo, Japan.
- China Statistic Press. 2005. China Statistical Year Book 2004. Beijing, China.
- Eastin, L, I. P. Boardman, and J. Perez-Garcia. 2002. A Competitive Assessment of the Japanese Forestry and Forest Products Sectors. CINTRAFOR Working Paper 87. University of Washington, Seattle, WA.
- Eastin, I, J. Roos, and P. Tsournos. 2003. Niche Market Opportunities for Alaska Forest Products in Japan. CINTRAFOR Working Paper 91. University of Washington, Seattle, WA.
- Economist. 2005. At Last, Japan's Banks are Creating Credit. September 10<sup>th</sup>. p68-69.
- Fujisawa, Y. 2005. Concerning the Spread of Pre-cut Wood and a View of its Future. (*In presentation*)
- Food and Agriculture Organization (FAO). 2001. State of the World's Forests. United Nations.
- Forest Agency. 2003. Annual Report on Trends of Forest and Forestry 2002. Ministry of Agriculture, Forestry and Fisheries of Japan, Tokyo, Japan. (*In Japanese*)
- Government Housing Loan Corporation. 1999. House Construction Data Survey. Tokyo, Japan. (*In Japanese*)
- Government Housing Loan Corporation. 2002. Jyutaku Kenchiku Syuyou Data Chousa. Tokyo, Japan. (*In Japanese*)
- Howard, J.L. 2001. U.S. Timber Production, Trade, Consumption and Price Statistics 1965-1999. USDA Forest Service, Research Paper. FPL-RP-595. 22 pp.
- Japan Lumber Journal. 2005a. Inspecting the Rapid Growth of Precut Lumber. Vol. 46 (6) 1-3.
- Japan Lumber Journal. 2005b. A Regional Builder Being Closely Watched in the Housing Industry. Vol. 46(15) 1-3.
- Japan Lumber Journal. 2005c. How Postwar Baby-Boomers Use Their Retirement Money for Housing. Vol. 46 (18) p10.
- Japan Paper Association. 2005. About Paper Industry. [*on line*] <http://www.jpa.gr.jp/en/about/abo/index.html>
- Japan External Trade Organization. 2002. The Trend of Japanese Remodeling Market. [*on line*] [www.jetro.go.jp/basic\\_trade/import/housing/market/pdf/market\\_2J1.pdf](http://www.jetro.go.jp/basic_trade/import/housing/market/pdf/market_2J1.pdf)
- Kitagawa M. 2005. Japan Market Report. *Pacific Rim Wood Market Report*. No.204.
- Ministry of Health, Labor and Welfare. 2005. Jinkou Doutai Toukei Sokuhou (June 2005). (*In Japanese*)
- Ministry of Land, Infrastructure and Transportation. 1998. Projection of the New Construction Market. Tokyo, Japan. (*In Japanese*)

- Ministry of Land, Infrastructure and Transportation. 2005a. The Report of Housing Starts Survey in 2004. Tokyo, Japan. *(In Japanese)*
- Ministry of Land, Infrastructure and Transportation. 2005b. The Outlook of Investments on Japanese Construction. Tokyo, Japan. *(In Japanese)*
- Ministry of Economy, Trade and Industry. 2001. 2000 Industry's Statistic. Tokyo, Japan. *(In Japanese)*
- Ministry of Economy, Trade and Industry. 2004. Census of Manufactures 2003. Tokyo, Japan.
- Miyadokoro, T. 2005. Sojitz Corporation Woodchip Section. Personal Communication.
- Nihon Keizai Shimbun (Nikkei). 2005a. GDP. (August 12th)
- Nikkei. 2005b. Food Gift Market Research has done by Fuji Keizai Co., press release. [on line] <http://release.nikkei.co.jp/detail.cfm?relID=97887&lindID=5> *(In Japanese)*
- Nikkei Weekly. 2003. Boomers Plan Retirement Spending. July 7<sup>th</sup> Page 5.
- Nippon Keidanren. 2005. Research Results about Retirement Allowance and Annuity. *(In Japanese)*
- Office of Trade and Industry Information. 2005. State Export Data. [on line] <http://tse.export.gov/>
- Ogi, T. 2002. Home Building and Home-Building Industry. In Forestry and the Forest Industry in Japan. UBC press. Vancouver, Canada. Pages 316.
- Oji Paper Group. 2005. Report: Business Model for Sustainability. [on line] <http://www.ojipaper.co.jp/envi/houkoku/env050921/09-18.pdf> *(In Japanese)*
- Research Institution of Construction and Economy (RICE). 2003. Semi-Long and Long Term Outlook of Construction and Macro Economy. *(In Japanese)*
- Statistics Bureau. 2004. Housing and Land Survey in 2003. [on line] <http://www.stat.go.jp/data/jyutaku/index.htm> *(In Japanese)*
- Stevens, R. 2006. SeaAlaska Vice President. Personal Communication.
- Takahashi, H. 2004. Kokusan-zai Seizai-hin. *Wood Industry*. 59 (11), 510-513. *(In Japanese)*
- The Reform (Construction News Paper). 2003. Market Data of Residential Remodeling. January 7<sup>th</sup>. No. 557. 6p.
- The People's Bank of China. 2005. The People's Bank of China Announcement. No.16. *(In Chinese)*
- Theisen, A., and J. Dirks. 1996. A Japanese Market Profile and Sourcebook for Pacific Northwest Value-Added Wood Products. Working Paper 23. CINTRAFOR, University of Washington, College of Forestry Resources, Seattle, WA.
- Watanabe. 2002. An Analysis and Future Projection of Japan's Paper Industry. [on line] <http://www.jopp.or.jp/sss/watanabe.html> *(In Japanese)*
- Warren, D. D. 2005. Production, Prices, Employment, and Trade in Northwest Forest Industries, All Quarters 2003. USDA Forest Service, Resource Bulletin. PNW-RB-247.

# **APPENDICES**

## APPENDIX A

### Japanese Basic Statistics (1975-2000)

	Total Population	Dependency Ratio <sup>a</sup>	Consumer Price Index <sup>b</sup>	Unemployment Rate (%)	GDP Change (%)	Residential Investment Change (%)	Exchange Rate US\$1 = yen	Total Housing Start
1975	111,940	11.7	54.5	1.9	3.1	1.2	305.15	1,356,286
1976	113,094	12.0	59.7	2.0	4.0	8.7	293.00	1,523,844
1977	114,165	12.4	64.5	2.0	4.4	0.5	240.00	1,508,260
1978	115,190	12.8	67.3	2.2	5.3	5.6	195.10	1,549,362
1979	116,155	13.2	69.8	2.1	5.5	-0.9	239.90	1,493,023
1980	117,060	13.5	75.2	2.0	2.8	-9.2	203.60	1,268,626
1981	117,902	13.9	78.8	2.2	3.2	-2.3	220.25	1,151,669
1982	118,728	14.2	81.1	2.4	3.1	-0.7	235.30	1,146,149
1983	119,536	14.4	82.5	2.6	2.3	-5.9	232.00	1,136,797
1984	120,305	14.6	84.4	2.7	3.9	-2.1	251.58	1,187,282
1985	121,049	15.1	86.1	2.6	4.4	2.6	200.60	1,236,072
1986	121,660	15.4	86.7	2.8	2.9	8.1	160.10	1,364,609
1987	122,239	15.8	86.7	2.8	4.2	22.4	122.00	1,674,300
1988	122,745	16.2	87.3	2.5	6.2	11.4	125.90	1,684,644
1989	123,205	16.7	89.3	2.3	4.8	0.9	143.40	1,662,612
1990	123,611	17.3	92.1	2.1	5.1	4.8	135.40	1,707,109
1991	124,101	18.0	95.1	2.1	3.8	-8.5	125.25	1,370,126
1992	124,567	18.7	96.7	2.2	1.0	-6.5	124.65	1,402,590
1993	124,938	19.4	98.0	2.5	0.3	2.4	111.89	1,485,684
1994	125,265	20.2	98.6	2.9	0.6	8.5	99.83	1,570,252
1995	125,570	20.9	98.5	3.2	1.5	-6.5	102.91	1,470,330
1996	125,859	21.8	98.6	3.4	5.1	13.6	115.98	1,643,266
1997	126,157	22.7	100.4	3.4	1.6	-16.2	120.92	1,387,014
1998	126,472	23.6	101.0	4.1	-2.5	-14.4	115.20	1,198,295
1999	126,667	24.4	100.7	4.7	0.5	1.4	102.08	1,214,601
2000	126,926	25.5	100.0	4.7	1.7	1.7	106.00	1,229,843
2001	127,291	26.5	99.3	5.0	0.4	-5.4	121.83	1,173,858
2002	127,435	27.6	98.4	5.4	-0.3	-4.2	125.52	1,151,016
2003	127,619	28.5	98.1	5.3	1.4	-1.1	116.29	1,160,083
2004	127,690	29.2	98.3	4.7	2.7	2.2	108.23	1,189,049

a. Dependency Rate is the percentage of elder citizen (65 or over) over working population (15 – 65 years old).

b. Consumer Price of 2000 is regarded as 100.

(Source: Japan Statistic Bureau)

## APPENDIX B

### Contact Information

#### American Softwoods

(SEC, APA and SPC)

Japan Office

Toranomon 40MT Bldg. 4F 5-13-1,

Toranomon, Minato-ku, Tokyo Japan 105-0001

Director: Yuichi Hayashi

Tel: (81)-3-5404-5268

Fax: (81)-3-5404-2650

Email: [info@americansoftwoods.jp](mailto:info@americansoftwoods.jp)

[http://www.softwood.org/international\\_offices.htm](http://www.softwood.org/international_offices.htm)

#### American Forest & Paper Association (AFPA)

##### Japan Office

Toshin Tameike Building 8F, 1-1-14

Akasaka, Minato-ku, Tokyo Japan 107-0052

Director: Ladd McDaniel

Tel: (81)-3-3583-2850

Fax: (81)-3-3589-1560

Email: [laddmacdaniel@gol.com](mailto:laddmacdaniel@gol.com)

<http://www.afandpa.org/>

#### American Hardwood Export Council

U.S. Embassy 10F, 2-11-5

Nishi-Temma, Kita-ku, Osaka 530-0047

Tel: (81)-6-6315-5101

Fax: (81)-6-6315-5103

Email: [info@ahec-japan.org](mailto:info@ahec-japan.org)

<http://www.ahec.org/>

#### U.S. Commercial Service

U.S. Embassy Tokyo

1-10-5 Akasaka,

Minato-ku, Tokyo 107-8420

Tel: (81)-3-3224-5060

Fax: (81)-3-3589-4235

Email: [Tokyo.Office.Box@mail.doc.gov](mailto:Tokyo.Office.Box@mail.doc.gov)

<http://www.buyusa.gov/japan/en/>

#### Japan External Trade Organization (JETRO)

(Tokyo Head Quarter)

Ark Mori Building, 6F 12-32, Akasaka 1-chome,  
Minato-ku, Tokyo Japan 107-6006

Tel: (81)-3-3583-2850

Fax: (81)-3-3589-1560

<http://www.jetro.go.jp/>

(San Francisco Office)

235 Pine Street, Suite 1700

San Francisco CA 94104

Phone: 415-392-1333

Fax: 415-788-6927

#### Japan Lumber Journal

25 Sankyo Bldg. #523

1-48-10, Higashi Ikebukuro,

Toshima-ku, Tokyo Japan 170-0013

Phone (81)-3-5950-2251

Fax: (81)-3-5950-2271

Email: [nlj@scan-net-ne.jp](mailto:nlj@scan-net-ne.jp)

<http://www.jlj.gr.jp/>

#### Japan Laminated Wood Association

Takamine Dai-2 Bldg. 2-22-4 Nishi-Shinbashi

Minato-ku, Tokyo Japan 105-0003

Tel: (81)-3-3434-6527

Fax: (81)-3-3434-6547

<http://www.syuseizai.com>

## APPENDIX C

### Future Tradeshows in Japan (2005-2006)

<u>Date</u>	<u>Name – Location</u>	<u>Contact Info</u>
Aug. 25-27, 2005	<b>Japan DIY Home Center Show 2005</b> Tokyo (Chiba) @ Makuhari Messe	Japan DIY Industry Association <a href="mailto:diy@smj.co.jp">diy@smj.co.jp</a> Phone: 03-3256-4475 Fax: 03-3256-4457 <a href="http://www.diy.or.jp/english/index.html">http://www.diy.or.jp/english/index.html</a>
Sep. 15-18, 2005	<b>Nikkei Living Reform Expo 2005</b> Tokyo @Tokyo Big Sight	Nihon Keizai Shimbun Phone: 03-5777-8600 <a href="http://www.reformhaku.jp">http://www.reformhaku.jp</a>
Sep. 16-17, 2005	<b>Japan Remodeling Show</b> Osaka @ Index Osaka	Remodeling Business Newspaper <a href="mailto:reform@cronos.ocn.ne.jp">reform@cronos.ocn.ne.jp</a> Phone: 03-5537-5811 Fax: 03-5537-5822 <a href="http://www.the-reform.co.jp/">http://www.the-reform.co.jp/</a>
Sep. 27-29, 2005	<b>Ecobuild 2005</b> Tokyo @ Tokyo Big Sight	Ecobuild Japan <a href="mailto:eco@delphi.co.jp">eco@delphi.co.jp</a> Phone: 03-5261-4451 Fax: 03-5261-5023 <a href="http://www.ecobuild.jp/english/index.html">http://www.ecobuild.jp/english/index.html</a>
Oct. 13-15, 2005	<b>Japan Gardening Fair for 2006</b> Tokyo (Yokohama) @ Pacifico Yokohama	NPO Garden wo Kangaeru Kai <a href="mailto:jgf@green-joho.jp">jgf@green-joho.jp</a> Phone: 052-571-7667 Fax: 052-571-2208 <a href="http://www.npogarden.com/jgf/jgf.htm#">http://www.npogarden.com/jgf/jgf.htm#</a>
Oct. 13-16, 2005	<b>Architecture Exhibition Nagoya 2005</b> Nagoya @ Fukiage Hall	The Mid Japan Economist Phone: 052-561-5675 Fax: 052-563-9133 <a href="http://www.chukei-news.co.jp/kenchiku2005/index.html">http://www.chukei- news.co.jp/kenchiku2005/index.html</a>
Nov. 8-11 2005	<b>Japan Home &amp; Building Show 2005</b> Tokyo @ Tokyo Big Sight	Japan Management Association <a href="mailto:jhbs@convention.jma.or.jp">jhbs@convention.jma.or.jp</a> Phone: 03-3434-1988 Fax: 03-3434-8076 <a href="http://www.jma.or.jp/jhbs/english/index.html">http://www.jma.or.jp/jhbs/english/index.html</a>
Nov. 17-19, 2006	<b>Home Builders Expo Osaka 2005</b> Osaka @ Intex Osaka	Japan Management Association <a href="mailto:jhbs@convention.jma.or.jp">jhbs@convention.jma.or.jp</a> Phone: 06-4797-2050 Fax: 06-4797-2051 <a href="http://www.jma.or.jp/jhbs/english/index.html">http://www.jma.or.jp/jhbs/english/index.html</a>

Jan. 16-17, 2006	<b>Japan Remodeling Show</b> Sendai @ Yume Messe Miyagi	Remodeling Business Newspaper <a href="mailto:reform@cronos.ocn.ne.jp">reform@cronos.ocn.ne.jp</a> Phone: 03-5537-5811 Fax: 03-5537-5822 <a href="http://www.the-reform.co.jp/">http://www.the-reform.co.jp/</a>
Mar. 7-10, 2006	<b>Architecture &amp; Construction Materials 2006</b> Tokyo @ Tokyo Big Sight	Nihon Keizai Shimbun <a href="mailto:arch@smj.co.jp">arch@smj.co.jp</a> Phone: 03-3512-5670 Fax: 03-3512-5680 <a href="http://www.shopbiz.jp/pages/t_index_e.phtml?PID=0004&amp;TCD=AC">http://www.shopbiz.jp/pages/t_index_e.phtml?PID=0004&amp;TCD=AC</a>
Jul. 1-2, 2006	<b>Japan Residential House Remodeling Fair</b> Tokyo @ Tokyo Big Sight	Remodeling Business Newspaper <a href="mailto:reform@cronos.ocn.ne.jp">reform@cronos.ocn.ne.jp</a> Phone: 03-5537-5811 Fax: 03-5537-5822 <a href="http://www.the-reform.co.jp/">http://www.the-reform.co.jp/</a>
Aug. 24-26, 2006	<b>Japan DIY Home Center Show 2006</b> Tokyo (Chiba) @ Makuhari Messe	Japan DIY Industry Association <a href="mailto:diy@smj.co.jp">diy@smj.co.jp</a> Phone: 03-3256-4475 Fax: 03-3256-4457 <a href="http://www.diy.or.jp/english/index.html">http://www.diy.or.jp/english/index.html</a>
Nov. 15-17, 2006	<b>Japan Home &amp; Building Show 2006</b> Tokyo @ Tokyo Big Sight	Japan Management Association <a href="mailto:jhbs@convention.jma.or.jp">jhbs@convention.jma.or.jp</a> Phone: 03-3434-1988 Fax: 03-3434-8076 <a href="http://www.jma.or.jp/jhbs/english/index.html">http://www.jma.or.jp/jhbs/english/index.html</a>

- Most tradeshow are annually held. Please check the future schedule on JETRO homepage.  
<http://www.jetro.go.jp/en/matching/j-messe/>

The above phone numbers do not include Japan's country code. In order to dial the above numbers, you need to first dial 011-81 and skip the first 0. For example, to dial the number 03-5537-58211 from the U.S., you dial 011-81-3-5537-58211.

## APPENDIX D

Approximate volume and specifications for structural lumber used in ground contact applications for a typical 30 *tsubo* (1,066 square feet) Japanese post and beam house.

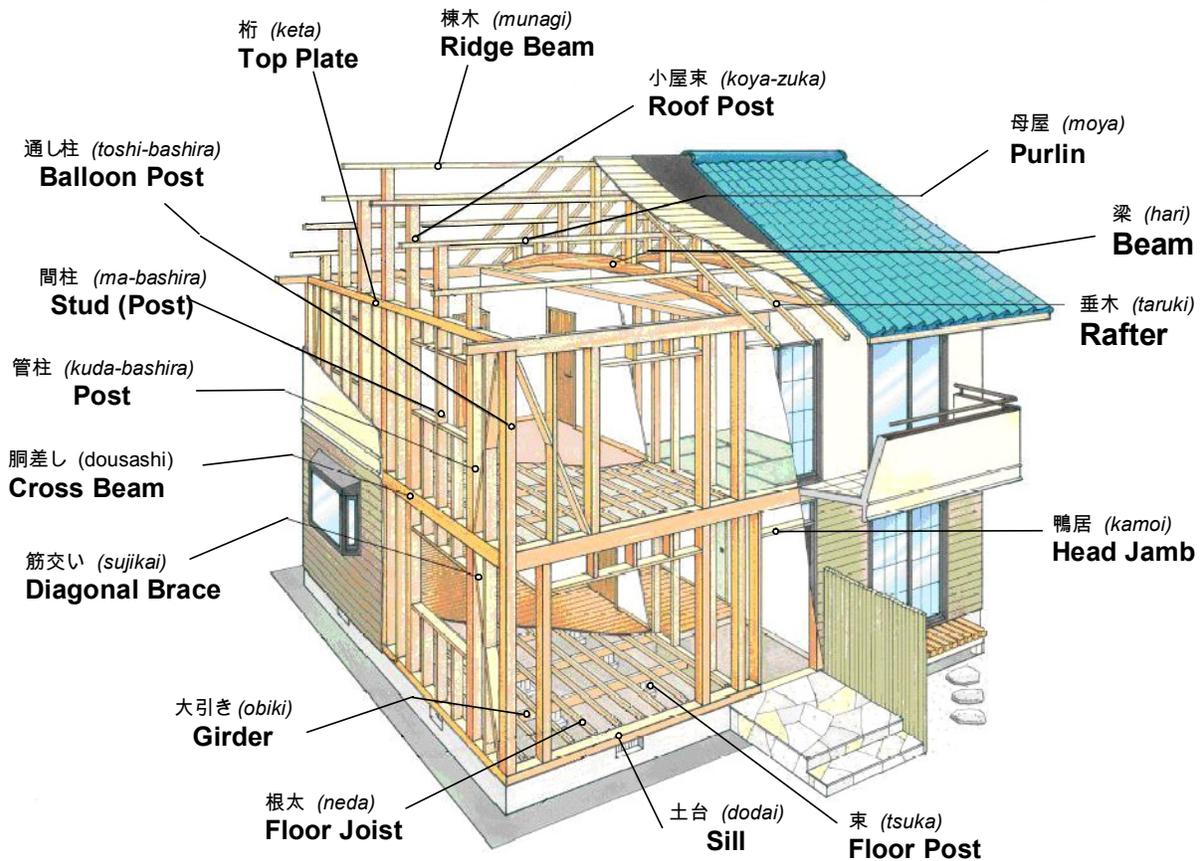
<b>Structural Member</b>	<b>English Translation</b>	<b>Cross-section size (milli-meters)</b>	<b>Length (meters)</b>	<b>Lumber Volume</b>
<i>Dodai</i>	Ground sill	105x105 (80-90) 120x120 (10-20)	4.0* 3.65, 3.0	0.8 m <sup>3</sup>
<i>Tsuka</i>	Floor post	90x90	Short lengths	0.2 m <sup>3</sup>
<i>Obiki</i>	Girder	105x105 (80-90) 90x90 (10-20)	4.0* 3.65, 3.0	0.2 m <sup>3</sup>
<i>Neda</i>	Joist	45x45, 45x60, 60x60, 45x105	4.0* 3.65, 3.0	0.7 m <sup>3</sup>
<i>Toshi-bashira</i>	Balloon Post	120x120 105x105	6.0	0.7 m <sup>3</sup>
<i>Kuda-bashira</i>	Post	105x105 (75) 120x120 (25)	3.0* 2.8 (2 <sup>nd</sup> floor)	1.7 m <sup>3</sup>
<i>Ma-bashira</i>	Non-structural stud	27x105 (70) 30x105 (25) 45x105 (5) new size	3.0* 2.8 (2 <sup>nd</sup> floor)	1.7m <sup>3</sup>
<i>Sujikai</i>	Diagonal wall brace	45x90	3.0	0.5 m <sup>3</sup>
<i>Hirakaku</i>	Structural beam	120x240, 105x210 105x180	4.0* (70-80) 3.0 (20-30)	5.0 m <sup>3</sup>
<i>Keta</i>	Top Plate	105x105	4.0	0.4 m <sup>3</sup>
<i>Koya-zuka</i>	Roof support post	105x105, 90x90	Various short lengths	0.4 m <sup>3</sup>
<i>Moya</i>	Purlin	90x90	4.0	0.7 m <sup>3</sup>
<i>Taruki</i>	Rafter	45x45, 30x40	4.0, 3.8 3.65, 3.0	0.5 m <sup>3</sup>
<i>Munagi</i>	Ridge beam	105x105 90x90	4.0	0.1 m <sup>3</sup>

Notes: 1 *tsubo* equals 3.3 square meters or 35.5 square feet  
\* indicates primary lumber length used.

(Source: Eastin *et al.* 2003)

## APPENDIX E

### House Diagram



Japanese Post and Beam Construction (Source: CINTRAFOR)

*Hirakaku* (平角): Cross beam.

*Shokaku* (正角): Squared lumber. Usually, *shokaku* is used for post.

*Kozo-zai* (構造材): Structural lumber. *Kozo-zai* includes structural post such as *toshi-bashira*, beam, *obiki*, *dodai*, and *moya*. Around 40 percent of total wood volume per house is structural.

*Hagara-zai* (羽柄材): Non-structural lumber. *Hagara-zai* includes stud post (*Ma-bashira*), *neda*, *sujikai*, *taruki*, and so forth. Around 36 percent of total wood volume per house is non-structural.

*Zosaku-zai* (造作材): Appearance grade lumber. *Zosaku-zai* is used for exposed applications where appearance is important. Around three percent of total wood volume per house is appearance grade lumber.

## APPENDIX F

### Conversion Factor

<b>1 Millimeter (mm) = 0.00394 Inch</b>
<b>1 Centimeter (cm) = 0.394 Inch</b>
<b>1 Meter (m) = 3.28 Feet</b>
<b>1 Square Meter (m<sup>2</sup>) = 1.20 Square Yards</b>
<b>1 Cubic Meter (m<sup>3</sup>) = 35.3 Cubic Feet</b>
<b>1 Hectare (ha) = 2.47 Acres</b>
<b>1 Kilogram (Kg) = 2.20 Pounds</b>
<b>1 Metric ton (M.T.) = 2200 Pounds</b>
<b>(Japanese unit)</b>
<b>1 Tsubo = 35.6 Square Feet</b>

## APPENDIX G

### Traditional Rooms vs Modern Rooms



Traditional Japanese post and beam houses have exposed beams and *tatami* mat family rooms.

Photo 1. Typical Japanese Traditional Rooms in 1960's



Western style houses in Japan generally do not have exposed lumber. Hardwood flooring is used and there are fewer *tatami* mat rooms. This style of house is popular with Japan's younger generation.

Photo 2. Typical Japanese Modern Rooms in 1990's

(Both exhibitions are from Japan Remodeling Show at Osaka, 2005)

**APPENDIX H**

**Photos**



**Photo 3. European Whitewood Laminated Wood**

European whitewood laminated wood are used for both posts and beams



**Photo 4. Metal Connectors and European Whitewood Laminated Wood**

Connectors became especially popular after the Great Hanshin Earthquake (1995)



**Photo 5. Hinoki Hot Tub**

*Hinoki* (Japanese falsecypress) is the most popular species for wooden hot tub in Japan because of its aroma. Alaska yellow-cedar is considered as great substitute for *hinoki*.



**Photo 6. Pre-Cut Lumber**

Douglas-fir pre-cut lumber at the job site. The mortise and tenon joints are routed in a pre-cut factory