WOOD MARKETING OPPORTUNITIES IN JAPAN

KENGO WATAI
WOOD 493
A REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF BACHELOR OF SCIENCE IN WOOD PRODUCTS PROCESSING

IN

THE FACULTY OF FORESTRY

APRIL 14TH 2009
Table of Contents

III Abstract .................................................................................................................................. 5

1.0 Introduction ........................................................................................................................................ 7

   1.1 Canada-Japan Marketing Relation History ..................................................................................... 7

2.0 Japanese Market Trends ............................................................................................................................ 9

   2.1 Current Economic Trend and Forecast .............................................................................................. 10

   2.2 Types of products used in Japan ......................................................................................................... 11

3.0 Regulation Trends ...................................................................................................................................... 13

   3.1 Green Revolution ................................................................................................................................. 13

   3.2 LCI Analysis ......................................................................................................................................... 14

   3.3 Woodmile Forum ................................................................................................................................ 19

4.0 Residential .................................................................................................................................................. 23

   4.1 Residential Economy History ............................................................................................................. 23

   4.2 Demographics ....................................................................................................................................... 23

       4.2.1 Three-Generation Families ........................................................................................................... 24

       4.2.2 Green Homes ................................................................................................................................ 24

   4.3 Building Codes and Earthquake Resistant Reinforcement ................................................................. 25

5.0 Marketing Opportunities ............................................................................................................................. 29

   5.1 Wood Incorporation in Homes ............................................................................................................ 29

   Regulatory Bodies ...................................................................................................................................... 33

Conclusion ............................................................................................................................................... 35
Figure 18 - Home Choices Source: (LAWLOR, Shawn, 2008) ...........................................................32

Figure 19 - Wood Housing Image Source: (LAWLOR, Shawn, 2008) ...........................................................32
1.0 EXECUTIVE SUMMARY

The following is a summary of the key points that are discussed in each section of the report.

1.1 JAPANESE MARKET TRENDS

The Japanese market is currently heavily affected by the demographic factors that control both the current shift in home construction style and the future demand with respect to green movements. Currently the CASBEE-Sumai and the Woodmile Forum is gaining recognition with their Woodmile index.

1.2 REGULATION TRENDS

The homes in Japan have seen heavy building code revamps with respect to earthquake resistance engineering and are opening marketing opportunity for home renovation and home improvement industries.

1.3 RESIDENTIAL TRENDS

The residential markets are seeing an increased awareness of green movements and are showing major shifts in the desire to have environmentally friendly homes. Many, however, show misunderstandings of wood and shun the use of it, calling it a tropical rainforest destroyer.

1.4 MARKETING OPPORTUNITIES

The engineered wood products markets are looking very promising in the Japanese housing markets, since the need for larger homes have made demands that are impossible with the current lumber usage. Also the chance for 2x4 markets to gain market share has been on the rise. Finally the
regulatory bodies in Japan should reconsider the use of the Woodmile to decide on the environmental friendliness of wood before cannibalization occurs in the wood markets between domestic and imported wood.

This essay is directed for those who seek marketing opportunities in Japan or are seeking for knowledge regarding current green movement in the forestry sector in Japan. It is assumed that the readers of this paper have some knowledge of engineered wood products, green regulations, and general knowledge of the forestry industry.
2.0 INTRODUCTION

Appreciation and a word of thanks would like to be extended Dr. David Cohen and Dr. Frank Lam from the University of British Columbia, for providing insightful knowledge on the Japanese market demands and trends. This analysis of the report would not have been possible without their help.

This essay will focus on the current Japanese market demands, the trends, and any marketing opportunities that arise from these demands and trends. The analysis will firstly focus on the marketing trends, economical situation, green movements and any regulatory changes that are seen in the wood products field. Secondly, the situation with the residential markets will be described in depth with respect to the demographic changes and changes in building codes. Finally the analysis for marketing opportunities will be presented with focus solely on the residential markets of Japan and any major regulatory bodies that are currently under spotlight.

2.1 CANADA-JAPAN MARKETING RELATION HISTORY

Throughout the history of the Canadian forestry industry, the Asian market has shared the position alongside the United States as the key player in the development of this industry in Canada. Within the Asian markets Japan was the first market to become a significant global importer; having a large portion of their demands being met by the BC forest industry. The first of the recorded trades with the Asian markets took place in 1788 by a ship that set sail from Vancouver Island's Nootka Sound with planks and spars for the Chinese market (PETER, Brian, 2006). The earlier records in the Japanese history books show that the shipments with Japan were actively initiated in the 1860's, when the Japanese markets experienced shortage in meeting their domestic lumber demands. This initial market, however, quickly faded as the First World War began. The forest products industry
began picking up pace again after the second world war when a shipment conflicts occurred domestically and reliance on import logs once again took place (WAKAYAMA PREFECTURE). As can be seen from Figure 1- Japanese Import History, within few decades the business quickly became an attractive investment opportunity for companies in many countries.

![Total Forest Product Imports (1961-2004)](image)

Figure 1- Japanese Import History

Source: (PETER, Brian, 2006)
3.0 **Japanese Market Trends**

Japan is characterized to be a country with very restrictive geographic conditions with large and concentrated urbanized demographics. This massive urbanization move took place in the mid 1950's shortly after the Second World War, leading to the increased economic activity in the residential construction field. Such urbanization stimulated the residential builders to increase demands in lumber. With such immense demand levels, Japan experienced a severe shortage in lumber supply and turned to the international market to fill the demand gaps.

![Figure 2 - Domestic vs. International Product and Self Sufficiency](image-url)
Figure 2 - Domestic vs. International Product and Self Sufficiency shows the domestic products in relation to the foreign products, and the self-sufficiency levels that Japan experienced during this time. The downward trend in the domestic products was seen mainly due to the competitive disadvantage that Japan has for procuring inexpensive lumber due to the inefficient mills located in very rural areas of Japan located far from where the main demands are (EASTIN, Ivan, 2008). This is also the time frame in which the Canadian markets began developing strong ties with the Japanese economy. This section of the report will discuss the economical situations of Japan and the trends in the types of products that are seen in the market.

3.1 Current Economic Trend and Forecast

The Japanese market has shown significant difficulties and declines in the past few years and hope of recovery were thin. As for the macro-economic view for Japan, the real GDP had fallen 3% between April and June, the top 750 companies in Japan have reported a 37% fall in the operating cash flow between April and June, and finally the corporate bankruptcies sky rocketed an average of 9.7% between June and August (LAWLOR, Shawn, 2008). Though the future is gloom, all hope is not lost for the Japanese market. Some firms in Japan, especially those supporting the green movement, are pushing to encourage the Japanese market to use this slowing economy as a “chance to attract the world’s attention to the possibility of greener home building options and environmental choices and their benefits in preparation for when the housing markets recover” (帝国データバンク, 2008). To support this optimism, the demographic outlook in Japan is now reaching a period in which the Y generation (often referred to as the echo generation (Figure 3 - Population Pyramid Japan)) is controlling the bulk of the market place (LAWLOR, Shawn, 2008).
The new generations hold advantages that reach much further than just simple youth. With the new and non-traditional approaches ingrained in their minds, this generation hold high hopes for innovative and drastic approaches to problems; ones that older generations struggled to find a long term solution to. Management Today refers to this phenomenon as the Y factor and comments “In Japan, as in many other countries, the mid-1960s are seen as a watershed, with the generation born after that time breaking with the tradition of lifelong corporate attachment” (WALLACE, Paul, 2000).

3.2 TYPES OF PRODUCTS USED IN JAPAN

Products exported from Canada to Japan show no limitations in type and usage. In the early 1950’s Canadian exports to Japan consisted 99% of raw lumber material, but quickly found themselves in the markets for a wide range of products in both the residential and industrial use (PETER, Brian,
As the usage of wood in Japan is heavily based on the demand for residential construction and housing starts, the market experienced (and still is experiencing) a shift in the import demands as the Western (2x4) platform construction increases market share. The traditional post and beam construction methods utilize over 1200 different dimensional parts per home. This proved to be a market which North American Lumber producers found impossible to tap, forcing majority of the exports to be in the form of logs or oversized lumber. The introduction of the Western (2x4) platform construction gradually led to the expansion of the lumber market, resulting in over 56,000 units being built by 1993 (CINTRAFOR). Following this change, the Japanese market also began to see many engineered wood products creep into the market, mainly the Glulam, Laminated Veneer Lumber (LVL) and the I-joist. Figure 4 - Imports of Canadian Wood Products to Japan illustrates the 2006 Japanese imports from Canadian market with respect to the forest products.

![Figure 4 - Imports of Canadian Wood Products to Japan](source: FAOSTATS, 2009)

We can clearly see that there is an evolution of the markets in Japan and it’s adaptation to globalization. Foreign market penetration has diversified the Japanese market and allowed greater options to be presented to the end users.
4.0 Regulation Trends

As discussed in the above sections, both foreign factors and domestics factors have contributed in increasing the foreign import of lumber. We mustn’t forget, however, that globalization moves such as these are only bright and pleasing news to those who are exporting the material to Japan. This globalization came as a plague for the mill operators who dominated the market prior to the foreign market entrance. Within the past 20 years, over 10,000 mills have been closed due to the reasons discussed above and the local people are now turning to government intervention for aid (EASTIN, Ivan, 2008). Majority of the intervention from the government is appearing in the form of green regulations that focus on the use of domestically harvested and treated wood. The three main regulations include the 1) CASBEE-Sumai (home) green home building program that focus on domestic timber, 2) subsidies provided at a prefectural level to increase domestic lumber usage to at least 50% and 3) subsidies at a national level to increase the domestic use of timber from 30% to 60% by 2015 in the post and beam industry (EASTIN, Ivan, 2008). The following “Green Revolution” section will reflect further on this (and similar) green initiatives and will elaborate on the opportunities and threats that they pose.

4.1 Green Revolution

The green revolution was first stemmed from the Kyoto Protocol. The Kyoto Protocol was a treaty signed in response to the increasing risks and scientific evidences suggesting a global climate change. With these risks and statistics are hand, the country leaders around the globe gathered under the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), an environmental treaty established in the United Nations Conference on the Environmental and Development (UNCED) in Rio de Janeiro, Brazil in June 1992. This movement had proceeded with the goal to reaching the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system” (Wikipedia,
2009). This had later lead to becoming a historical mile stone, becoming the only agreement to be signed internationally promising a common goal of reducing the green house gas emission. This agreement was implemented in Kyoto on December 11\textsuperscript{th} 1997; hence on referred to as the Kyoto Protocol. Following the Kyoto Protocol, a wave of green movement has swarmed the Japanese market. These green initiatives include the use of environmentally friendly building products and low carbon footprint architecture (EASTIN, Ivan, 2008). Although the goal of this Japanese green initiative is directed towards a uniform goal, there are still fundamental problems in this plan. The lack of understanding in the environmental consequences of changes in forest management, building construction and wood products manufacturing creates false accusation of wood products; ultimately leading to decisions made by government policy makers and home owners that are detrimental to the environment. To truly understand the environmental impacts of building products, the full range of the carbon foot print must be considered including the raw material procurement, processing methods, construction processes, purpose of the structure, repair and maintenance of the building and finally the disposal of the structure. (EASTIN, Ivan, 2008). The following section will provide more detailed discussion on how the Life Cycle Inventory (LCI) Analysis has affected the Japanese markets.

4.2 LCI Analysis

As the public becomes increasingly aware of the environmental concerns around the globe, the cry for raising the bar for environmental regulations have never been greater. As well, now is the most opportune moment to bring increased awareness to the public regarding the LCI for building components. Every moment that passes, decisions that shun the use of wood products are made and supported at all levels of the industry and at the political level. As honorable and good willed these decisions are, more often than not, the full negative consequence with the use of non-wood building material is not understood. The decisions to use non-wood substitutes are often based on
incomplete or misleading information that suggests that non-wood substitute material are environmentally healthier. The following three points tend to be the most widely cited reasons for favoring wood substitutes: 1) Saves trees, 2) Non-wood substitutes often incorporate recycled materials, 3) Not enough information is available to compare and assess the environmental impacts that wood products and non-wood substitutes pose (EASTIN, Ivan, 2008).

The first two reasons result from the ignorance in the full environmental impacts associated with the entire life cycle of the building material. To fully compare the building component’s environmental impacts, the LCI must be taken into the assessment. Failure to do this will result in a distorted assessment of the environmental impact of the construction material.

Life Cycle Inventory Analysis is defined as the “phase of life cycle assessment involving the compilation and quantification of inputs and outputs, for a given product system throughout its life cycle” (ACLCA). Of the many stages in the Life Cycle Analysis (LCA), this stage is considered to be one of the most straightforward portions. The general idea of the LCI can be explained with the use of Figure 5 - Toaster LCI Analysis (SANGWON, Suh and Gjalt, Huppes, 2005).

![Figure 5 - Toaster LCI Analysis](source)

For the production of one toaster, a total of 1kg of Steel, 0.5 MJ of Steam, and 2 kg of CO2 is used per production of 1 toaster (totaling 5 kg of CO2). During the toaster’s lifetime, every bread that it toasts,
there is 0.001kg of CO2 produced, and finally 0.5 kg of CO2 is produced upon disposal of the unit. Now if we assume that one toaster makes 1000 toasts before it is disposed, we can calculate the total CO2 produced throughout the life cycle of the toaster.

\[
\left( \frac{1 \text{ kg CO}_2}{\text{kg steel}} \cdot 1 \text{ kg steel} \right) + \left( \frac{4 \text{ kg CO}_2}{\text{MJ steam}} \cdot 0.5 \text{ MJ steam} \right) + \left( \frac{2 \text{ kg CO}_2}{\text{unit toaster prod.}} \cdot 1 \text{ unit toaster prod.} \right) + \left( \frac{0.001 \text{ kg CO}_2}{\text{piece of toast}} \cdot 1000 \text{ pieces of toast} \right) + \left( \frac{0.5 \text{ kg CO}_2}{\text{unit toaster disposed}} \cdot 1 \text{ unit toaster} \right) = 6.5 \text{ kg CO}_2
\]

Figure 6 - Toaster LCI Analysis Calculation

*Source: (SANGWON, Suh and Gjalt, Huppes, 2005)*

Much like this calculation, a similar calculation was performed for wood, steel and concrete building components (including not only CO2, but also Methane and Nitrous Oxide). The results are as follows (presented in global warming potential values):
Figure 7 - Global Warming Potential, Wood vs. Steel Wall

Note that the Abbreviations MN stand for Minneapolis where the wood and steel houses were situated.

Source: (LIPPKE, Bruce et al., 2004) modified by (EASTIN, Ivan, 2008)
Figure 8 - Global Warming Potential, Wood vs. Concrete Wall

Note that the Abbreviations ATL stand for Atlanta where the wood and steel houses were situated

*Source: (LIPPKE, Bruce et al., 2004) modified by (EASTIN, Ivan, 2008)*

Figure 9 - Global Warming Potential, Wood (Lumber, I-joist) vs. Steel vs. Concrete

*Source: (LIPPKE, Bruce et al., 2004) modified by (EASTIN, Ivan, 2008)*
The above data require little explanation and clearly show that the wood products outperform their substitute materials of concrete and metal with flying colors with respect to their global warming potential. The wall in figure 5 all contain very similar GWP values for the vapor, gypsum, vinyl siding and show visible differences in the fiberglass and plywood. The difference truly becomes obvious with the introduction of the lumber and steel into this equation. Similarly, figure 6 also show very similar results in the values for the vapor, gypsum, and lumber, but clearly set a difference in the plywood and vinyl siding compared with concrete. Figure 9 - Global Warming Potential, Wood (Lumber, I-joist) vs. Steel vs. Concrete

**Source:** (LIPPKE, Bruce et al., 2004) modified by (EASTIN, Ivan, 2008) is also in agreement with the previous arguments on concrete and steel vs. the use of wood. The above data gives valuable insight on the quality of the construction material in terms of environmental friendliness with respect to the LCI. Some organizations in Japan argue that this system is still not enough to measure the true environmental consequences of construction material. Organizations such as CASBEE have raised concerns in regards to the fact that the LCI analysis neglects the CO2 released during the shipment and processing of the raw and finished material. The Woodmile Forum located in Tokyo have developed their own assessment methods by incorporating the distance the material has travelled into a quantified measure, similar to the GWP. The following section will shift the focus more on the Woodmile Forum, their objectives, and market reactions to their initiative.

### 4.3 Woodmile Forum

Woodmile is one that is increasingly gaining recognition in the Japanese forestry market as an extension of the LCI. This system was developed by The Woodmile Forum to incorporate the distance the building material has travelled in calculating the size of the carbon footprint. This initiative received great credit due to the geographical conditions of Japan. Being an island country with majority of their supplies shipped from foreign sources, they are heavily fuel dependent with
material procurement. The initiative also takes into account the idea that with all of the tropical deforestation issues around the world, wood as an eco-friendly image has been deteriorating. By focusing on the use of domestic products Woodmile hopes to contribute to meeting the Kyoto Protocol milestone and stimulate the domestic mill operations (THE WOODMILE FORUM).

Woodmile is accepted and backed by LEED, CASBEE, and the local governments at the prefecture level. LEED was originally developed by the U.S. Green Building Council (USGBC) in working towards encouraging and accelerating global implementation of sustainable green building. They are also driven to designing tools that provide universally understood and accepted standards and performance criteria (LEED is acronym for Leadership in Energy and Environmental Design (LEED) Green Building Rating System) (CANADA GREEN BUILDING COUNCIL). CASBEE is a green program stemmed from the commitments made under the Kyoto Protocol designed to reduce the environmental footprint of commercial and residential buildings (CASBEE is an acronym for Comprehensive Assessment System for Building Environmental Efficiency(CASBEE).

Let us see how the Woodmile system operates and what it implies before discussion regarding this method is made. Firstly, as discussed above, Japan is heavily reliant on the importation of foreign lumber prominently due to their geographic constraints. Figure 10 - Import Statistics of Japan, United States, Germany

Source: (FAOSTATS, 2009) modified by(THE WOODMILE FORUM) shows the volume of imports by Japan, United States (top two importers of the world in terms of wood), and Germany (the next largest importer amongst the western countries) and divides the imports by distance that the wood has traveled.
We will assume that the definition of a close country is within a 1000km radius, mid-distant country is between 1000 km – 8000 km, and a far country is over 8000 km away. We see that the greatest importer is United States, and the smallest importer is Germany. In terms of distance the wood has travelled, however, Japan clearly surpasses any other country with 64% of their inventory being farther than 1000km and 35% being farther than 8000 km. The wood mileage is measured on increments of how far 1\text{m}^3 of material has been carried in km. To calculate the wood mileage value, the volume of the wood transported (\text{m}^3) is simply multiplied to the distance (km). When this calculation method is used and the above data is translated into wood mileage values, Figure 11 - \textbf{Wood Mileage of Japan, United States, Germany} Source: (FAOSTATS, 2009) modified by (THE WOODMILE FORUM) can be extracted.
These figures allow us to make a more in-depth analysis of the Japanese wood products industry and the CO2 emissions that associates with it. The Japanese wood mileage is 384 billion (m\(^3\)·km), and opposed to that the US mileage is 84 billion (m\(^3\)·km) and Germany is 18 billion (m\(^3\)·km). This implies that Japanese consumers spend 4.5 times more compared to Americans and 21 times more compared to Germans.

**Figure 11 - Wood Mileage of Japan, United States, Germany**

*Source: (FAOSTATS, 2009) modified by (THE WOODMILE FORUM)*
5.0 Residential

With respect to the discussions above, analyses for further marketing opportunities were conducted in the residential wood products field.

5.1 Residential Economy History

The use of BC lumber in the residential applications in Japan had began in the ___ and continued until the First World War. Between the First World War and the Second World War, trades once again took place with the highlight peak during the relief after the 1923 Kanto-Daishinsai earthquake in Japan (PETER, Brian, 2006). Following the Second World War, a movement towards urbanization triggered the full force of lumber trades between Canada and Japan once again. As can be seen in table 4, the steady increase in import of forest products from Canada (with particular focus on raw lumber) can be observed. The only two major declines in import took place in the 80's and the late 90's which were due to the Japanese economic recessions. Though it is still tough to judge whether we are entering another round of depression or not, it is clear that the economic trade activity with Japan is currently on a downward trend.

5.2 Demographics

For the past two decades, there has been a large shift in the Japanese population which many statistician call “population aging”. This is a phenomenon in which the mean population of the nation or the region increases. This trend is common throughout the globe, with the exception of 18 countries termed by the United Nations 'demographic outliers' (Wikipedia). The population aging has brought with it several key trends on the market with new opportunities following each. The
two key changes highlight in the economy now is the three-generation families and the green revolution.

5.2.1 Three-Generation Families

We are seeing increased forms of “three-generation families” in which grandparents live along side their children and grandchildren. Such moves are requiring the need for larger homes, with flexibility in future reinforcement plans that may take place as the needs of the occupants evolve over time (i.e. The two children who used to stay in one room may now require a divider wall and separate doors). (PETER, Brian, 2006) Such homes will require designs with structural members that do not require pillars that would typically result in interfering with renovative needs (Figure 12- Adaptable Homes)

Figure 12- Adaptable Homes

Source: (KEY-TEC INC.)

We can expect to see such changes in coming decades bringing exceptional stimulation to the field of renovation construction.

5.2.2 Green Homes
Much like how the X Generation has gone through the “Hippie Love & Peace” wave, the generation that is now entering the work force, also commonly known as Y Generation, have been raised through the phase of the green revolution. Awareness that has built up amongst the youth in Japan has lead to increased environment-conscious investments (DAS, Sohini, 2007). Though many current home owners are narrowing their focus to products such as eco-friendly home electronics and heat insulating windows, new campaigns are being launched to promote green engineered wood products. Although still not applied legally in the Japanese construction, the “Green Point” system for construction of buildings have continually gained momentum in the United States (FALK, Robert L., 2007) and have also received a very positive spotlight in the Japanese media (IBUKA, Shigehito). We expected to see that this generation will maintain the green movement, creating new opportunities in this new emerging market.

5.3 BUILDING CODES AND EARTHQUAKE RESISTANT REINFORCEMENT

It has been roughly 50 years since the first official building code regarding earthquake resistance has been issued. Since then, whenever there is a major disaster or a building related issue arises; the building codes have been re-issued. Figure 13 shows the timeline for each major change in buildings codes that took place.
The Ministry of Land, Infrastructure, Transport and Tourism of Japan has moved into requiring all buildings built on older regulations to have an official "Earthquake Resistance Analysis" completed with reference to the updated regulations. The ministry has enforced this rule under the law of "Earthquake-Resistance Repair Movement". Also, a building that was build prior to the new building codes (but have received approval from the older building codes) are not considered a legal violation, but is classified as “unqualified for existing use”. In the case that multiple users exist for a given building (such as apartments), the legal owner of the building are required to perform an earthquake resistance analysis. In cases that repairs and renovations are required for these buildings, the owners are legally bound to “Obligations in showing effort” for providing the necessary construction (E-GOV, 2006).

With the passing of the new building codes, the market for earthquake reinforcements has opened up for many research facilities. Products that have been invented many years ago designed to reinforce for earthquake resistance is now finally receiving spot light (日経産業新聞, 2009). An example of such product is the Keytec Earthquake-Proof Frame. More often than not, the lack of
stability in a home (with respect to earthquake resistance) is caused by the strength in the shear wall (清水正義 et al., 2002) and the eccentricity between the center of mass and center of rigidity. (NEWNAN, Donald G. and Banks, James H., 2004) When the destruction in of wooden homes in the Kobe 1995 earthquake is observed, many of the homes had failures in their main floors from the collapse of the shear wall (清水正義 et al., 2002). Though it is difficult to determine after the destruction, it is assumed that many of these homes had collapsed due to shear wall failure from torsion movements, and not simply from the horizontal movements (清水正義 et al., 2002). A major factor for the destruction was seen as the lack of balance in the center of rigidity and center of mass (also known as the eccentricity). The center of rigidity is the point in which the structure tends to rotate when exposed to eccentric force. In the case of an earthquake, this rotation occurs at the product of the center of mass of the structure (typically calculated by the mass of each wall on the floor) and the center of rigidity (typically calculated by the shear walls and floor rigidity).

As can be seen from Figure 14 – Eccentricity, the larger the eccentricity, the larger the twisting becomes, ultimately resulting in the failure of the structure. The Keytec Earthquake-Proof Frame is designed to reinforce the walls in rigidity to adjust and balance the center of mass and center of rigidity (J 建築システム株式会社, 2008). The frame has also been tested to show that they are
capable of maintaining form even after the destruction of the home, ensuring that there is an exit for the occupants even after the collapse of the home. This point is especially important with the fact that 73% of the casualties during the 1995 Kobe earthquake were due to suffocation from being trapped under the building, and not directly by the falling rubbles (FARAZMAND, Ali, 2001).

Clearly, this frame is not the only option for reinforcement, but is a viable and inexpensive one. The point that should be focused on here is the importance of affordable earthquake proof reinforcement and renovation. With the current economic concerns, many home owners living in earthquake prone homes are finding these reinforcement regulations as too much of a financial burden. The Japanese government too has intervened with financial assistance to promote this new earthquake reinforcement regulation. An example of this is seen in the Kochi prefecture, a location where many of the current homes standing now were built prior to the 1981 Showa Era. The Kochi municipal government is supporting a service in which a home owner can request an earthquake resistance analysis on their home for 3000 yen (~$38 CAD), and if deemed that reinforcement is required, a maximum of 600000 yen (~$7800 CAD) of financial aid will be provided (NHK (JAPAN BROADCASTING CORPORATION)).

Regulations and concerns such as these are opportune moments for the North American marketers to identify products that will meet these regulations and bring comfort to the Japanese consumers. The following sections will reflect on all of the discussions above and provide marketing opportunities with respect to each topic.
6.0 Marketing Opportunities

Much like the changes seen in the last decade, the decade to follow from here is surly to be filled with changes and shifts in the market place. As anyone with business backgrounds would tell you, times of change are times of opportunity. This section will give an overview of possible business opportunities for the forest products industry with respect to home construction in the renovative markets and the new housing starts market, and collaboration opportunities with the regulatory bodies.

6.1 Wood Incorporation in Homes

As discussed in section 4.2, the demographics in Japan have gradually changed to require larger homes with renovative capabilities during the lifetime of the home. In addition, due to the economic downturn of the Japanese market, home owners increasingly looking for inexpensive homes. The solution to such demand can be found in slightly rural parts of major cities like Tokyo. The land prices in 80% of Tokyo’s wards have dropped, reaching a more affordable price. The very efficient transportation system of Japan also offers ease of transportation to those who live far away from their workplace. From here, the 2x4 construction methods can be effectively marketed for its fast building pace, as many of the parts are pre-assembled, and also (as discussed earlier) require much less dimensional components compared to the traditional post and beam construction. This will effectively cut costs and will increase the market familiarity of building with wood.

Another potential opportunity is in the engineered wood products. The proposed large, post-less three-generation families home would be very difficult with the traditional lumber applications used in the current market. With the structural properties of a lumber, the home would be greatly limited to the size, and would prove to be very expensive.
Figure 15 - Engineered Structural Lumber Use

Source: (KEY-TEC INC.)

A fairly accurate representation can be seen with the current I-joist usage in Japan. The I-joist (or also commonly referred to as the I-beam) is a flooring joist seen often in the residential construction field in North America and other parts of the world. The I-joist can be characterized by the unique shape resembling an "I" (hence the name), consisting of a web (OSB section) and a flange (two outer LVL/lumber sections). Due to the strong properties in the I-joist, the joist is capable of spanning larger distances than the solid lumber joists and also holds the potentials to reduce the cost of assembling the floor unit (FISETTE, Paul, 2000). Though such potentials are hidden in the I-joist, the Japanese market seems to show a differing opinion. As seen from Figure 16 and Figure 17, the current Japanese residential market, in contrast to orth America, still rely heavily on solid wood for their floor joist material.
The I-joist had entered the Japanese market roughly 15 years ago, but has shown very little progress in the markets. However, with this new law, the attention of builders is expected to be directed more and more towards the engineered wood products. The I-joist is considered an excellent building material under the green point system for its design which uses only ~50% of the material that a lumber joist would use. (WOOD I-JOIST MANUFACTURERS ASSOCIATION (WIJMA))

With the combination of the structural stability and the green marketing, the I-joist has great potential to grow in the Japanese residential market place.

Not only has the green revolution triggered a growing demand for economically friendly products, it has also triggered a large demand for “natural” products. According to the Japan Consumer Survey, 71.2% of the general public wishes to build or live in a single family home (SFH) (Figure 18 - Home Choices)

**Source:** (LAWLOR, Shawn, 2008)), and 82.7% of the general public expresses positive attitudes to a wood home and describes it as “Comfort / Warm Environment” (Figure 19 - Wood Housing Image **Source:** (LAWLOR, Shawn, 2008)).
The opportunity for wood use in homes are not only isolated to the new home starts, but also to the renovation market. As discussed in section 4.3, many organizations are researching new and improved ways of implementing wood as earthquake resistant materials. An example of this was seen at the University of British Columbia. With the new regulations demanding stricter building
codes, Canada has taken this opportunity to regain market shares in Japan for their coastal hemlock and oriented strand board (OSB) production. In 2008, with partnership from Japan's Building Research Institute, the Center for Better Living and Public Works Research Institute, UBC's Department of Wood Science and the forest industry, successful performance and documentation for the structural coastal hemlock (known as Canada Tsuga in Japan) and the OSB in one of the most severe seismic forces ever was completed (DAILY COMMERCIAL NEWS, 2008). We can expect to see similar studies emerging as time goes on, and as well, we can expect wood markets to show continual growth in the Japanese market.

**REGULATORY BODIES**

The newest move in the green movements of Japan is the Woodmile Forum movement. Though this Woodmile data proves significant importance in the environmental aspect of imported and domestic wood, an argument exists that sole reliance on this data to support the domestic lumber is too narrow minded (EASTIN, Ivan, 2008). The rejection of import lumber will only lead to cannibalization in which there will be an unnecessarily large artificially created battle between the domestic lumber and import lumber. By observing the current Japanese market, the economic values are quite obvious, and the Japanese consumers will also request the cheaper option in the end. An alternate, and most definitely more mutually agreeable, option would be to have government bodies provide subsidies to the Japanese mills to assist upgrading their facilities to becoming more competitive, and to increase the market share of lumber use in general. There is no doubt that the use of wood is far more beneficial than the use of steel or concrete or many of the other substitutes (as discussed in section 3.2), and unnecessary battles within the wood products market would only hinder this progress.

The move to provide subsidies to the Japanese mills would bring positive benefits in two sectors. The first is in the increased self-sufficiency of the lumber market. This will not only provide jobs, but will ensure that the wood product usage is actively promoted by policy makers. The second would be in the general
increase of the market share in the construction materials, and the possibility of substituting wood in place of other building materials that are much more damaging to the environment.
7.0 Conclusion

The Japanese markets have shown considerable shifts and have opened market opportunities for many industries. These changes, however, must be monitored carefully to insure that wrongful or misguided decisions are not made to compensate for the change. One such decision is the goal of domestic regulatory bodies such as the Woodmile Forum requiring stricter environmental control and the attempts to promote the domestic lumber use. The initiative to aim for cleaner building materials and reducing the CO2 emissions in the air is genuinely accepted, however the methods to achieving this must be thought out explicitly. Any unnecessary regulations that prohibit the foreign lumber will only create cannibalizing situations, increased costs, and ultimately be detrimental to the goal of replacing non-environmentally friendly materials (concrete, steel, etc.) with wood. Not only are there opportunities in the regulatory fields, there are also opportunities in the housing starts markets. As described in the analysis, the use of engineered wood products and the 2x4 construction methods are some of the very efficient ways to increase the public awareness of wood alternatives. We must realize though, that this shifting of demand is nowhere near the end. Both the market competitors and the regulatory bodies of Japan must keep open eyes on these changes and adapt efficiently to this. Success can be guaranteed with the continual commitment to push the use of wood and replace the environmentally harmful materials, combined with the increasing public awareness of the environmentally friendly nature of wood.