Future Markets for Treated Wood

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Summary

Canadian exports of treated lumber to the US have soared over the past few years, reflecting a resurgence of the trend for North American's love affair for outdoor living. When considering future markets for Canadian treated wood, it is important to recognize that domestic shipments and exports to the US have and will continue to dominate, primarily for decking, fencing and landscaping. In addition to new construction, repair and renovation will likely remain strong. It was estimated in 1992 that the installed value of treaded wood products in Canada is over $10 billion (Carroll-Hatch International Ltd.). Extending this result to the US would lead to an estimate of over $100 billion.

Having said this, there are growth opportunities, both in other end-uses in North America and in other geographic markets. These include:

North America:

Potential for future use of treated lumber in construction, primarily in the US south for termite protection. While this would be tempered by competition with treated southern yellow pine, the size of this potential end-use is so large that the South could not be totally self sufficient. Further, in certain construction end-uses, particularly wall framing, builders prefer S-P-F, Douglas-fir and hem-fir.

Japan

Unlike North America, the Japanese use of treated wood is primarily in new home construction, particularly for the sill plate of their post & beam style houses. Given the virtual disappearance of CCA treated wood, this market is in turmoil, creating a number of opportunities for Canadian treated product, most likely treated and kiln dried. Like the US south, it is also possible that Japan will consider using treated lumber in other parts of the house, provided that it meets their "healthy house" criteria.

Emerging Pacific Rim Economies

While offshore markets have been relatively minor to date, continued economic growth combined with housing deficits in such countries as China, South Korea, Thailand and even Chile offer tremendous future potential. When treated for termite protection, wood offers a natural low-cost alternative to traditional building materials.

Market Potential in North America

There are two main categories of end use for treated wood in North America:

- **industrial**, including utility poles, marine pilings, railway ties and industrial lumber and;
- **consumer lumber**, including patios, decks, fences, landscaping and construction lumber. While 'construction lumber' does include sills and permanent wood foundations, the majority of treated wood in this classification is decks that are built as a part of a new housing start.

Canadian production and export volumes of the industrial category of treated wood has been rather stable over the 1990s. When looking forward to the next couple of decades, there is no reason to expect this to change dramatically, at least not in the North American market. However, an estimated $6.5 billion dollars worth of industrial treated wood products have been installed in Canada alone (Carroll-Hatch International Ltd., 1992). By extrapolation this would exceed $60 billion in the US. Sooner or later, these products will need replacement. While concrete and steel may well be used for a portion of the replacements, the market for treated wood is not expected to disappear.

The brighter picture exists for consumer lumber, where Canadian production and exports to the US have grown dramatically over the past few years. This growth is being fuelled by continued replacements and by new building of decks, etc., reflecting the continued resurgence in the desire for 'outdoor living' in the US and by the continued growth in repair and renovation generally. From the replacement side, it has been estimated that the installed value of treated consumer lumber in Canada is roughly $3.5 billion, which by extrapolation would be over $35 billion in the US.

It was noted in the definition of consumer lumber above, some treated wood does find it's way in the US to component members in house construction other than decking and fencing. Most notably, this includes sills and to a smaller degree permanent wood foundations. **While the amount of treated wood going into these applications is small, it is just this end use that shows the largest potential for growth as we look out toward the coming decades.** The reason for this is the growing problem wood is having in termite infested areas, particularly in the US south. While the US south currently consumes roughly 450 million board feet of treated lumber a year (again, primarily for decking, fencing, etc.), consumption would grow to nearly 6 billion board feet a year if all framing lumber on new housing starts were treated! And while southern yellow pine might benefit most from such a shift in building practices, treated Canadian S-P-F, Douglas-fir and hem-fir would also benefit tremendously. This is due in part to the inability of the US south to be self- sufficient in lumber, and in part for builder's preferences for Canadian product, particularly in wall framing.

Market Potential in Japan

When looking at future market potential of treated wood offshore, one cannot help but to start with the bellwether market, Japan. This is a market that not only has a tradition of wood use in housing, it is also a significant user of treated wood.

While not a significant importer of treated wood products, domestic production has consistently been over 400 thousand cubic metres over the past decade, with a recent decline to under 350 thousand cubic metres given the turndown in Japanese housing starts. Unlike North America, the main end-use for treated wood in Japan is for sill plates in post&beam housing construction. Other non-industrial uses include other components of residential buildings, decks (although minor as compared to the US or Canada), and industrial uses such as poles and rail ties.

When looking to the future, there are a number of important trends that must be observed:

- CCA as a treating agent is out;
- In their traditional post & beam construction technique, a 'pre-cutting' industry has been developed which necessitates the use of kiln dried lumber or glulam;
- Platform frame starts as a percentage of all wooden housing starts continue to climb;
- Japanese builders, architects, pre-cutters and consumers are all becoming highly performance oriented; this performance includes seismic and longevity;
- "Healthy house" is much in demand.

Because of Japan's love of wooden single family structures, combined with less than ideal climatic conditions for wood durability and termites, the market for treated wood is expected to remain very strong. In fact, given the growing desire for 'outdoor living' in Japan, and that like the US South, more consideration may be given to treating additional members of the single family house, the growth in the demand for treated wood in Japan could be spectacular. To give a sense of the growth potential from increased decking, fencing and other outdoor living items alone, the per capita use of treated wood in Japan .0032 cubic metres, compared to .066 for the US and 0.08 for Canada.

Whether or not an increased demand for treated wood in Japan could ever translate into increased export potential for Canada is uncertain. The best way to see this happen would be through a combination of treated building system components (including manufactured housing), and marketing treated dried lumber, both solid and engineered. The advantage is giving the Japanese a product that they want (dried, durable) and treating where the best penetration is achieved (before drying). The caveat? The treated product will have to be considered "healthy house" friendly (borates a possibility).

Market Potential in Emerging Pacific Rim Economies

Outside of North America and Japan, wood is definitely not the material of choice for housing in the Pacific Rim. While reasons for this include cultural preferences, much of the Pacific Rim is also subject to termite damage. As we develop more environmentally attractive wood preservatives, it is hard not to get a little excited about the potential for growth in wood housing.

There are a number of reasons to support such optimism. First and foremost, countries such as China, South Korea, Taiwan, Thailand, India, and much of South America have the following attractive ingredients:

- They have large populations, some with relatively low urban concentrations;
- While their per capita GNP is low relative to Western standards, the annual growth is much higher (China, Taiwan, South Korea and Thailand, for example, all have annual growth rates of 6-8%, compared to the US at less than 2%);
- All of these countries having housing deficits (housing stock relative to population ranges from 13% to 23% relative to 45% in the US);
- Wood can offer an economical alternative to cement and steel construction;
- Wood use is increasingly being seen as an environmentally friendly building material as compared to cement and steel.

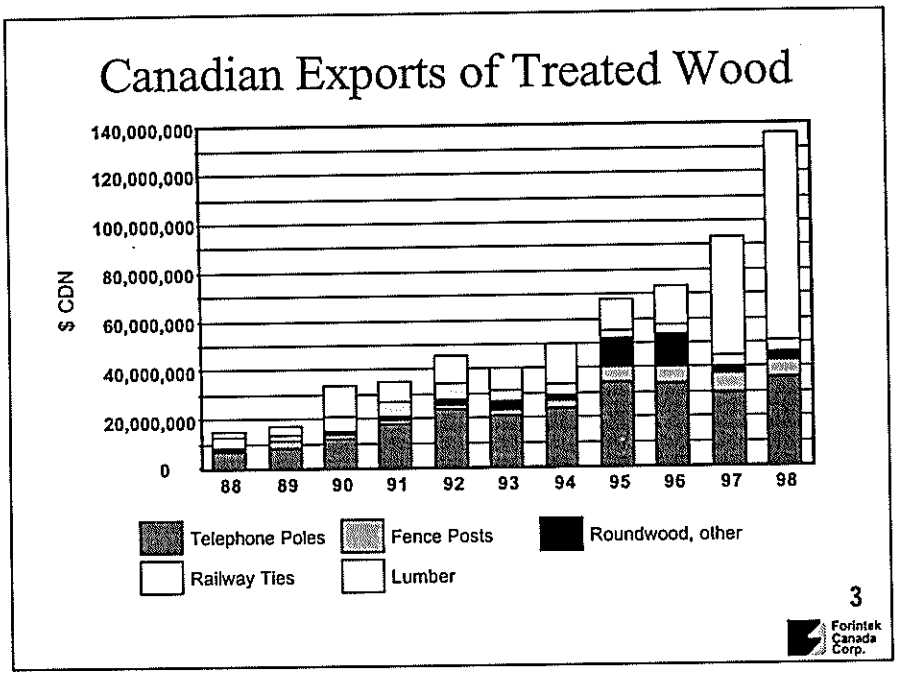
However, optimism in these markets is still reserved for the longer run. The reasons for this include cultural preference for cement and brick and the lack of building expertise with wood; an adoption of platform frame housing is not going to happen over night, any more than it did in wood-loving Japan. Further, it should be noted that the one thing that most of these countries DO have is inexpensive labour. This suggests that sales of manufactured housing or panalized systems are not likely the best way to go. A preferable solution would be to teach builders how to use wood, and create a market for Canadian lumber. Whether or not this can create a market for treated wood is analogous to the comments just made about Japan.

The Future of Wood

It has been suggested in this paper that in all markets, from North America to emerging Pacific Rim economies, the largest potential for an increase in Canadian exports of treated wood will come from the growth of its use as a construction material.

At the same time, evidence of non-wood substitution in residential construction can easily be found in North America, Japan and Western Europe. Before getting too excited about substituting wood for non-wood homes in such countries as China, we must remember that maintaining the markets we now have may be a challenge. While treated wood may be a part of the solution, this is not at all clear as yet, making the importance of research and development for the treated wood industry critical.

While wood is being substituted for non-wood due to concerns over durability, maintenance, and price volatility, technology can help correct the problem. But if we are really going to insure that wood is going to remain the housing building material of choice in North America and Japan, and become the material of choice in other countries, it will be not only because of performance and price, but because of the environmentally sustainable nature of wood relative to the alternatives. In this light, the challenge to the treated wood industry is to incorporate durability attributes into our 'engineering' of wood products, and to do so in an environmentally friendly manner (real and perceived). Further, this must include being environmentally friendly to the house occupant, especially if the treated wood product is going to be used inside the building envelope.


Canadian Exports of Treated Wood
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
$ CDN
88 89 90 91 92 93 94 95 96 97 98
Telephone Poles
Fence Posts
Roundwood, other
Railway Ties
Lumber
3
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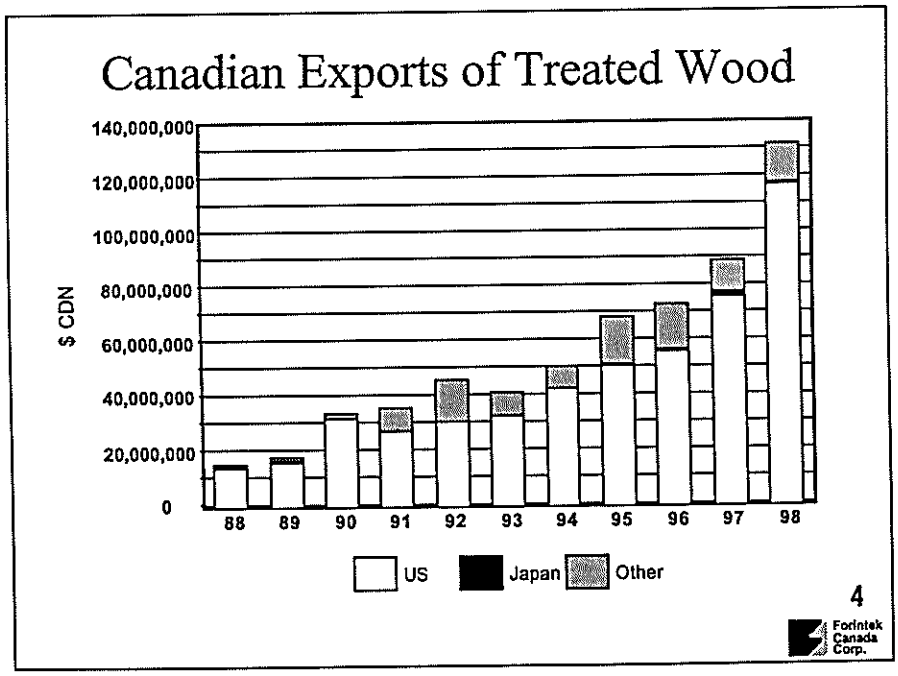
Canadian Exports of Treated Wood
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
$ CDN
88 89 90 91 92 93 94 95 96 97 98
US
Japan
Other
4
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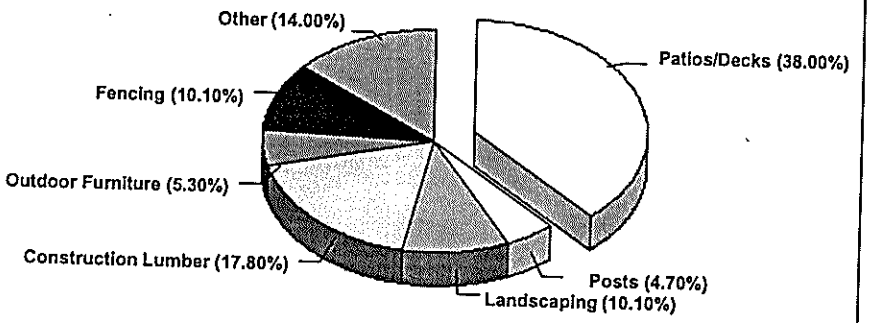
Specific End-Uses of Treated Consumer Lumber (R&R) in the U.S. (RISI, 1990)



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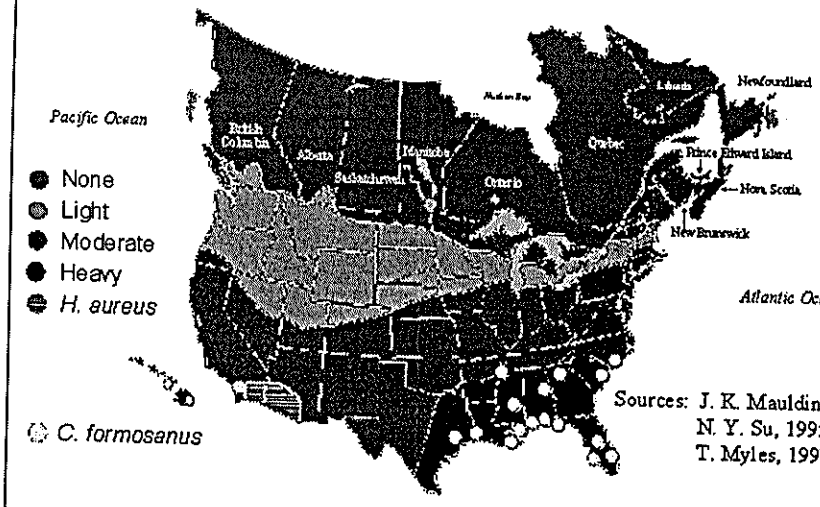
Subterranean Termite Zones of North America



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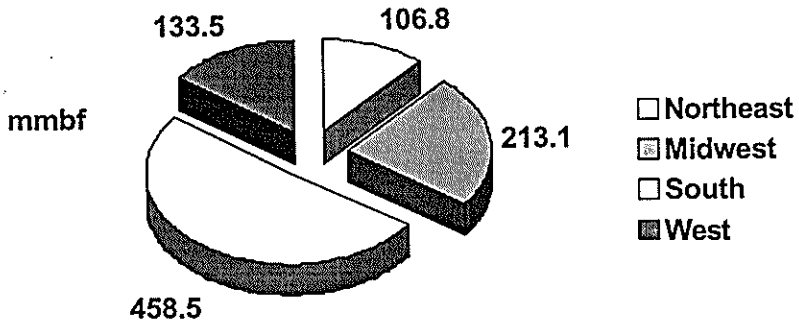
US Consumption of Treated Wood
(NAHB, US Census)



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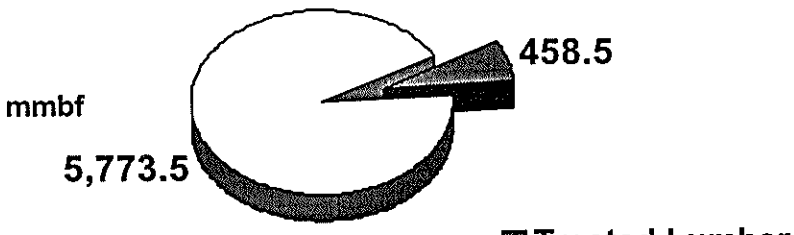
US South Wood Consumption
(NAHB, US Census)



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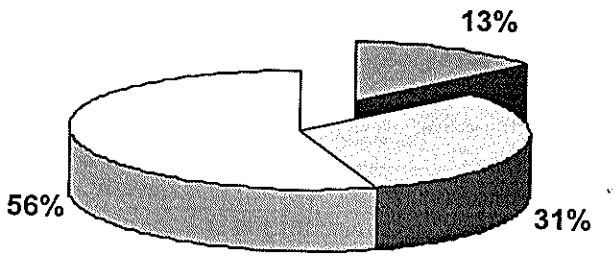
US South Wood Use in Walls
(NAHB)



1.57 billion bf

- SYP
- Doug/Hem-Fir
- SPF

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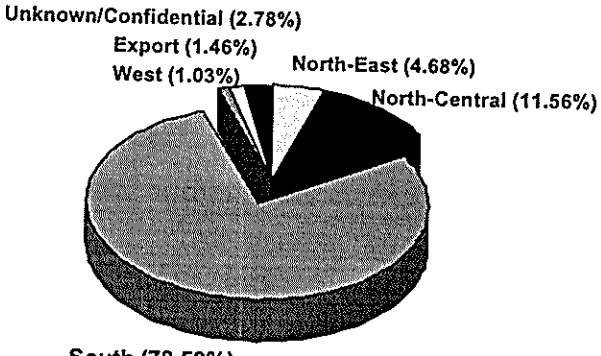
Future Export Prospects to the US?

US South Lumber Shipments



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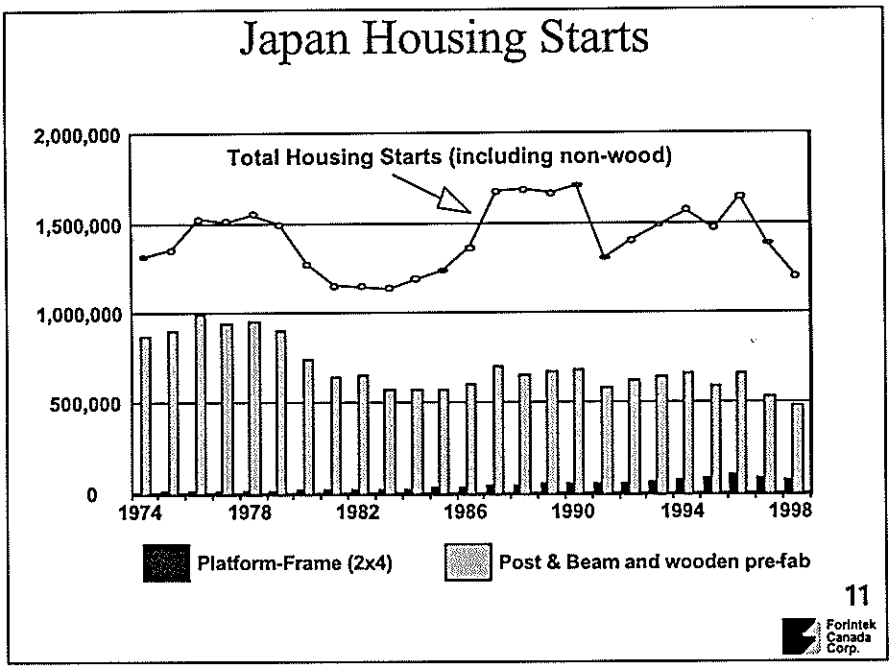
Japan Housing Starts
2,000,000
1,500,000
1,000,000
500,000
0
Total Housing Starts (including non-wood)
1974
1978
1982
1986
1990
1994
1998
Platform-Frame (2x4)
Post & Beam and wooden pre-fab
11
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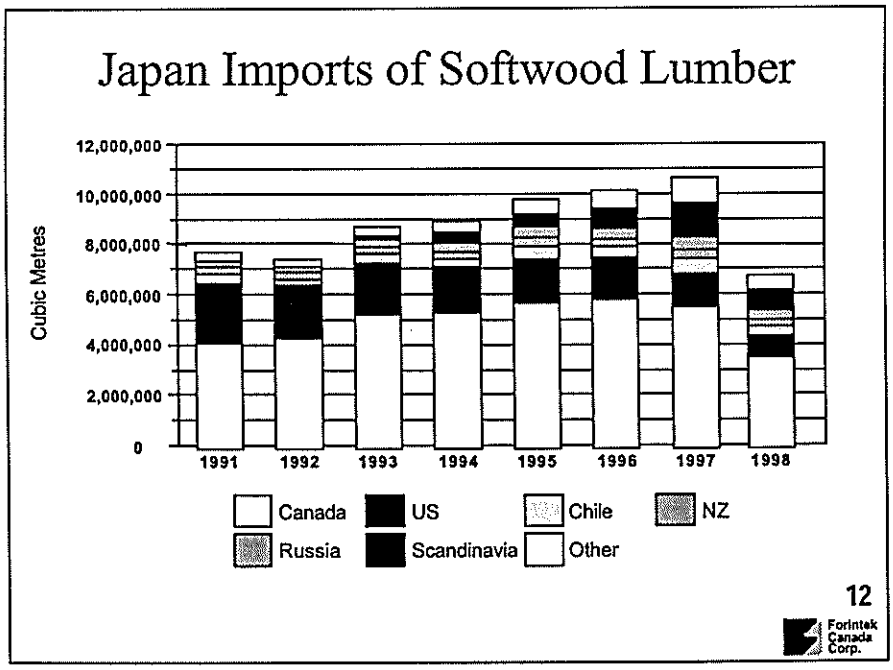
Japan Imports of Softwood Lumber
Cubic Metres
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
1991
1992
1993
1994
1995
1996
1997
1998
Canada
US
Chile
NZ
Russia
Scandinavia
Other
12
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Attribute Analysis

Building Systems for Builders (Forintek)

Attribute Preferences:

	score	
Durability	268	←
Strength	265	←
Construction method	177	←
Design	162	←
Structural material	122	
Green vs. dry	103	
Detached	81	
Size of house	37	
Size of structural members	26	
Country of origin	10	

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Attribute Analysis

Outdoor Furniture and Decking for Consumers (Forintek)

Attribute Preferences:

	score	
Durability	199	←
Price	173	←
Material	125	←
Ease of maintenance	78	
Finish	72	
Color	19	

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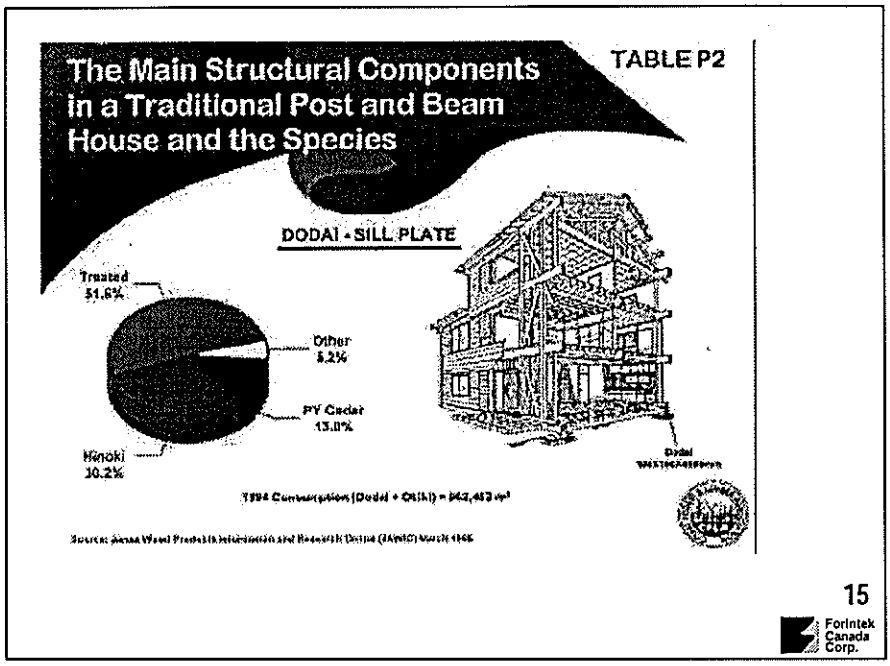
The Main Structural Components in a Traditional Post and Beam House and the Species
TABLE P2
DODAI - SILL PLATE
Treated 51.6%
Other 5.2%
PY Cedar 13.0%
Hinoki 30.2%
15
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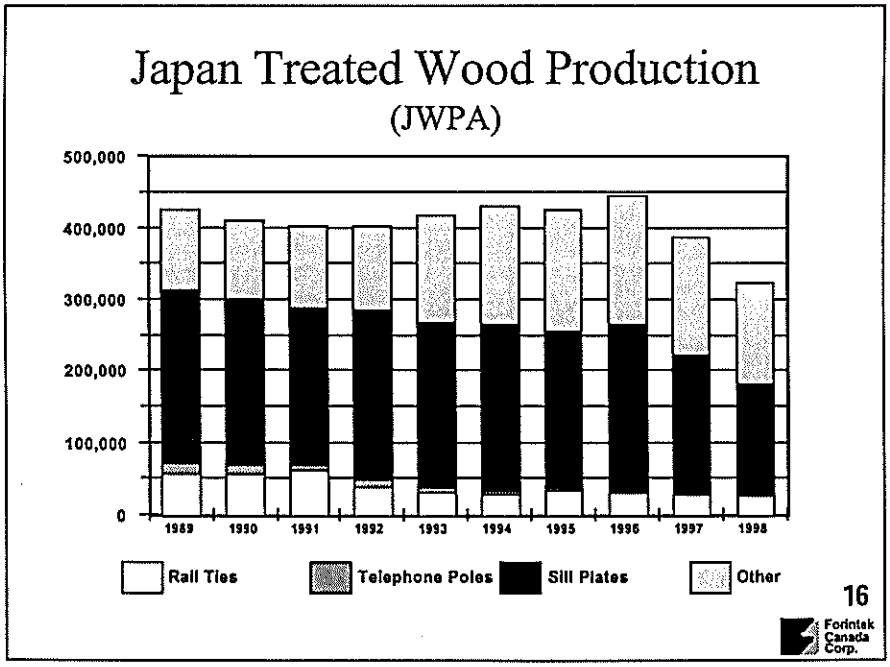
Japan Treated Wood Production
(JWPA)
500,000
400,000
300,000
200,000
100,000
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
Rail Ties
Telephone Poles
Sill Plates
Other
16
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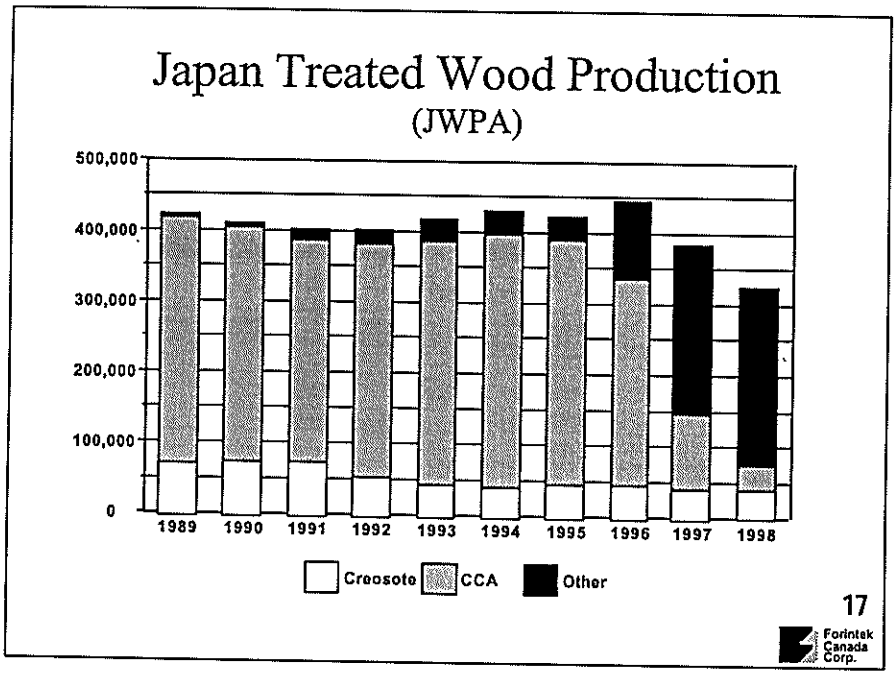
Japan Treated Wood Production
(JWPA)
500,000
400,000
300,000
200,000
100,000
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
Creosote
CCA
Other
17
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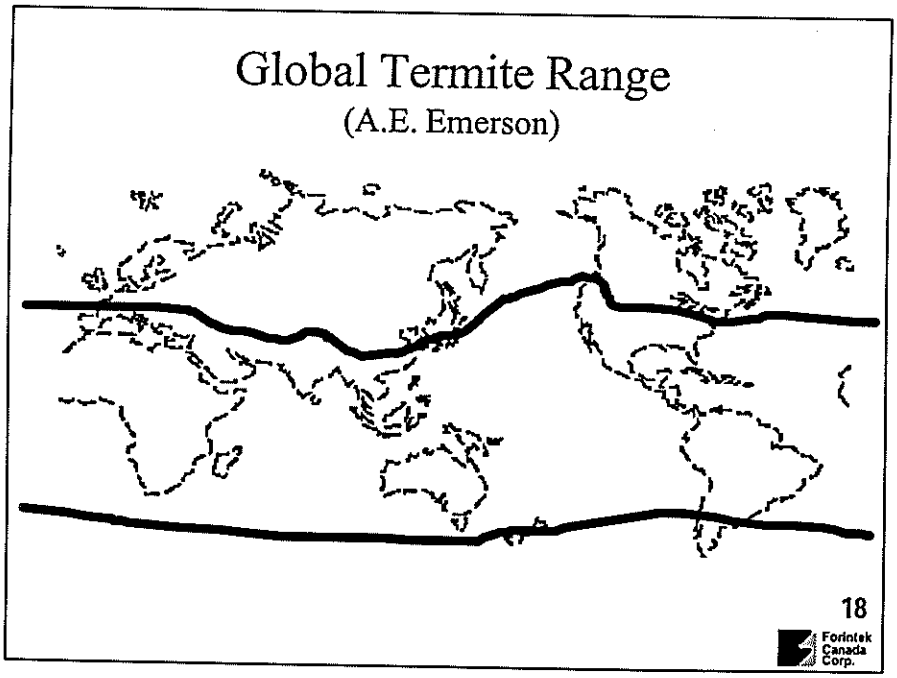
Global Termite Range
(A.E. Emerson)
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Leading Producers of Cement & Bricks
(United Nations)

Cement (000s Tonnes)

China	244,656
Japan	89,564
Russia	77,463
US	65,052
India	50,000
Korea	39,167
Brazil	27,491
Mexico	24,682
Thailand	19,210

Clay Bricks (Millions)

China	448,507
Russia	23,668
Ukraine	7,241
US	5,494
Vietnam	3,769
S. Africa	2,209
Australia	1,765
Czechoslovakia	1,704
Netherlands	1,465

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China

Population:	**1,178,400,000**	
Growth Rate:	**1.4%/year**	
Urban Population:	**29%**	
GNP/Capita:	**US$490**	**US: $24,750**
GNP Growth/Capita:	**8.2%**	**1.7%**

Total Housing Stock: 276.5 million (23%) 114.5 million (45%)

		1980	1990	1998
Production:				
(000s m3)	**Lumber**	21,010	23,037	26,870
	Panels	2,296	3,396	14,499
Imports:				
(000s m3)	**Lumber**	139	821	3,145
	Panels	50	2,296	5,088

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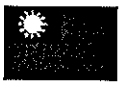
Taiwan

Population:	**21,100,000**
Growth Rate:	**1.4%/year**
Urban Population:	**N/A**
GNP/Capita	**US $10,000**
GNP Growth/Capita:	**N/A**



Total Housing Stock: 4.7 million (22%)

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China

("Exploring Change in the New Asia")

- 14.2 million housing starts in 1998
- 290 ft² average
- 6 storey concrete multi-family walk-up
- Cost is $38 ft² US for empty concrete shell ($53 finished)
- 290 x 53 = $15,370 which is 10 x annual dual income salary

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China
("Exploring Change in the New Asia")

- The end of company supplied housing
- NEW and USED housing markets developed
- 700 million ft^2 of empty new houses (or 2.4 million homes @290 ft^2)

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Change in the Chinese Market
("Exploring Change in the New Asia")

	Reality	Demand*
Size	290 ft^2	1100 ft^2
Price	\$38/ft^2 + 40%	\$32 - \$37/ ft^2
Style/Comfort	Utilitarian	Personalised

*Weyerhaeuser Company Survey

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South Korea

Population:	**44,100,000**
Growth Rate:	**1.1%/year**
Urban Population:	**78%**
GNP/Capita	**US$7,660**
GNP Growth/Capita:	**8.2%**

Total Housing Stock: 7.9 million (18%)

		1980	1990	1998
Production:				
(000s m3)	**Lumber**	3,043	3,963	4,759
	Panels	1,634	1,343	2,485
Imports:				
(000s m3)	**Lumber**	0	691	985
	Panels	0	1,070	1,728

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Thailand

Population:	**58,100,000**
Growth Rate:	**1.7%/year**
Urban Population:	**19%**
GNP/Capita	**US $2,110**
GNP Growth/Capita:	**6.4%**

Total Housing Stock: 11.2 million (19%)

		1980	1990	1998
Production:				
(000s m3)	**Lumber**	1,565	1,170	300
	Panels	150	449	548
Imports:				
(000s m3)	**Lumber**	445	1,485	1,360
	Panels	8	49	88

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India

Population:	898,800,000
Growth Rate:	2.0%/year
Urban Population:	26%
GNP/Capita	US $300
GNP Growth/Capita:	3.0%

Total Housing Stock: 120.8 million (13%) (1992)

		1980	1990	1998
Production:				
(000s m3)	Lumber	10,976	17,460	18,567
	Panels	252	387	348
Imports:				
(000s m3)	Lumber	17	19	10
	Panels	0	10	47

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Chile

Population:	13,800,000
Growth Rate:	1.7%/year
Urban Population:	84%
GNP/Capita	US $3,170
GNP Growth/Capita:	3.6%

Total Housing Stock: 3.3 million (24%)

		1980	1990	1998
Production:				
(000s m3)	Lumber	2,297	3,331	4,661
	Panels	115	349	1,066
Imports:				
(000s m3)	Lumber	0	0	24
	Panels	0	0	20

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Conclusion

- Maintenance
  - replacement of over $100 billion worth of installed treated wood in N.A.
- Short-term growth
  - continued increase in North American demand for treated consumer wood products
- Longer-term growth
  - adoption of treated wood as a residential construction material
    - US South
    - Japan (kiln dried lumber, solid and EWPs; panels)
    - Emerging Pacific Rim economies

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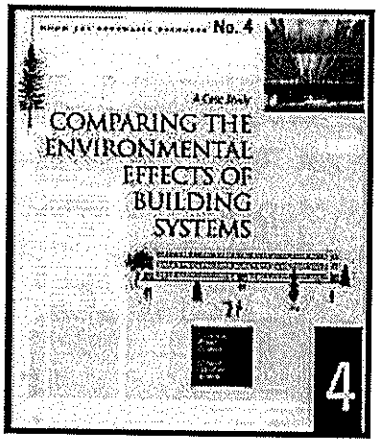
Conclusion

- Global view on wood as a renewable, minimal "footprint" material



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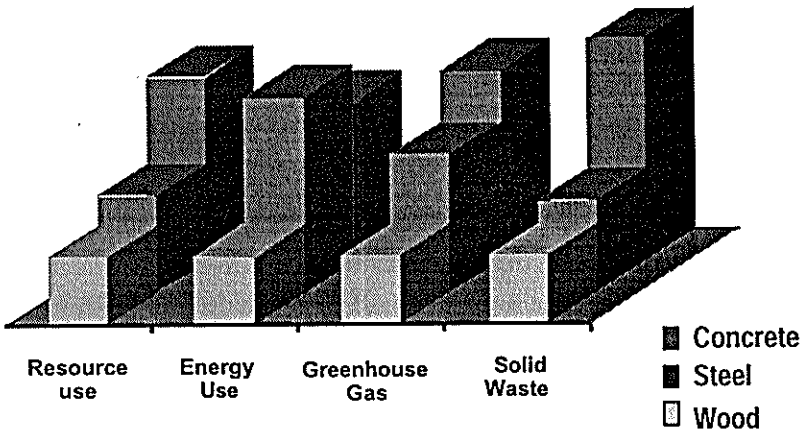
Athena Results



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Conclusion

- Global view on wood as a renewable material
- Using wood in areas of high moisture and/ or high insect infestation (need for preservation treatment)
- Ability of the treated wood industry to develop and market outside and "inside" environmentally friendly products

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