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Analysis of 2x4 Technology Transfer to the Japanese Residential Housing Industry

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Executive Summary

Japan is the largest export destination for the US and the second largest export destination for Canada (after the US). The Japanese residential construction housing industry is the main driver of forest products exports to Japan. There were 1.4 million residential housing starts in Japan compared to 1.5 million starts in the US in 1997. Japan has roughly the same level of housing starts as the US but has only half the population on a land mass the size of California.

North American-style 2x4 housing has grown at double-digit rates over the past 10 years. In 1996, 2x4 houses commanded 13% of the wooden house market share and 6% market share of the overall housing industry. 2x4 housing starts are expected to grow further because of active promotion of imported housing by the Japanese government, deregulation of the industry, and increasing appreciation for western design by Japanese consumers.

2x4 home construction in Japan has been observed to be less efficient and accurate than in North America. The differences in construction techniques increase the cost and time of construction of the house, and decrease its overall quality. Various strategies are currently used by North American companies to provide technical assistance in 2x4 construction technology to Japanese construction industry professionals. This technical assistance allows Japanese professionals to be more aware of proper construction techniques to reduce costs and increase the overall quality.

This project was undertaken to identify the technology transfer strategies that North American companies use, which of them are most effective, and which parties should be the most important targets of technology transfer training programs. An understanding of the most effective technology transfer methods would allow various parties involved with exporting 2x4 houses to Japan to implement more successful training programs.

Survey of North American companies involved in the 2x4 housing industry in Japan

A census of all companies in the Pacific Northwest involved in North American-style 2x4 construction projects in Japan was conducted. A total of 270 companies based in the US (191 firms) and Canada (79 firms) were mailed a four page survey regarding their delivery of North American 2x4 construction technology transfer to Japanese construction industry professionals. The response rate for US and Canadian companies was 48% and 58%, respectively, with an overall response rate of 52%.

Overall quality of 2x4 housing built by Japanese construction industry professionals

The respondents indicated that the overall quality of 2x4 houses built by Japanese construction industry professionals, relative to North American standards was only average. In addition, respondents reported that the quality of structural framing was also average while the quality of architectural design ranked well below average.

Understanding of 2x4 construction technology

Survey respondents were asked to rank Japanese contractors' understanding of 14 components of 2x4 construction technology. The components least understood were drywall, ventilation and architectural design. To improve the overall quality of a 2x4 house built in Japan, these three components should have more emphasis during technical transfer training activities. The components of the 2x4 construction system that were best understood included interior carpentry, roofing, flooring, doors, windows, exterior finishing, and weatherproofing. In an open-ended question, the respondents most often identified the structural framing of 2x4 houses as the one area where Japanese construction industry professionals have the weakest understanding, with 19% of all open-ended responses.

Respondents were next asked to rank which components of the 2x4 construction system they emphasize when providing technical assistance to Japanese construction industry professionals. All of the components except foundation and roofing were identified as being important.

Promotion of 2x4 construction technology

Despite the fact that 2x4 houses have been built in Japan for over 25 years, the overwhelming majority of respondents indicated that continued efforts to promote 2x4 construction technology are very important, with 63% indicating that was very important. There were few major differences between US and Canadian companies, and despite the double digit growth rate of 2x4 housing starts over the past 10 years, North American builders and exporters still feel that it is important to continue promoting technical transfer of the North American 2x4 construction system.

Respondents were asked to rank their use of eight different training methods. It was found that hands-on construction in Japan and employing North American site supervisors in Japan were the two methods respondents most frequently use. Instructional videos, hands-on construction training in North America, and classroom seminars in Japan and North America were rarely used. When asked to identify the single most effective strategy for achieving technology transfer, 20% of the respondents identified hands on construction training in Japan.

Respondents felt that North American construction companies and North American building material exporters would be the most effective in promoting technology transfer. North American construction companies were the most frequently cited group, with 27% of the open-ended responses. The organizations that were perceived to be least effective in promoting technology transfer were Japanese building material distributors and both North American and Japanese colleges.

Factors restricting export potential of 2x4 houses

The most important factors restricting the export potential were a lack of builder and carpenter familiarity with imported building materials and 2x4 construction technology. In terms of non-technology transfer related factors, the current severe economic condition was mentioned most often. The idea that “2x4 housing [is] a fad that will fade” was not an important factor restricting exports.

Conclusion and Recommendations

This study suggests that North American builders and building material exporters perceive that many Japanese construction professionals do not have strong technical understanding of the North American-style 2x4 construction technology. The vast majority of respondents indicated that they have developed technical training programs for their Japanese customers. However, several recent technical assessments of 2x4 construction projects in Japan suggest that this lack of technical understanding is much more pervasive and the extent of technical deficiencies in 2x4 homes built in Japan is much greater than exporters are aware. These studies suggest that it is time for North American builders and building materials exporters to work with the Japanese construction associations to develop a comprehensive technical training program to ensure that 2x4 homes are built correctly in Japan. The recently passed Housing Quality Assurance and House Inspection Laws further emphasize the need for a comprehensive and effective 2x4 technology transfer training program. The alternative, sporadic and uncoordinated technical transfer programs provided by individual companies, will not lead to effective and widespread transfer of the North American-style 2x4 construction technology in Japan. Ultimately, it is in the best interest of North American and Japanese companies to ensure that 2x4 homes are built properly in Japan. Otherwise, consumer perceptions that 2x4 homes in Japan are inferior in terms of overall quality or long-term performance, relative to other types of housing technologies, will lead to the decline of this important segment of the residential construction market in Japan.

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