

# C I N T R A F O R

## Working Paper 111

### Review of the Japanese Green Building Program and the Domestic Wood Program

Ivan Eastin. 2008

#### Executive Summary

Japan is a timber deficit country that requires substantial volumes of imported timber to meet its domestic demand for wood. To a large degree, wood demand in Japan is tied to housing starts where approximately 43% of new homes are framed with wood. This reliance on imported wood has always caused a tension in Japan where forests cover two-thirds of the country and there is an extensive sawmill industry skewed heavily to small, rural sawmills using out-dated technology. A high cost structure has made both the forestry and sawmill industries uncompetitive on a global scale and, as a result, imported softwood lumber has come to dominate the Japanese market. Over the years, the Japanese government and the forest products industry have tried a number of strategies to improve the competitiveness of the forestry and sawmill sectors. Despite the closure of more than 10,000 sawmills over the past twenty years, the Japanese sawmill industry remains uncompetitive and plagued by small, inefficient sawmills located in rural areas far from the main demand markets. It is against this backdrop that the most recent regulatory initiatives to protect the domestic sawmill industry from international competition must be viewed. These regulatory initiatives include: 1) providing preferential treatment for domestic timber within the proposed CASBEE-Sumai green home building program, 2) using subsidies at the prefectural level to increase the share of domestic timber used in post and beam wooden homes to at least 50% and 3) and using subsidies at the national level to target an increase in the market share of domestic timber used in the post and beam industry from the current 30% to 60% by 2015.

Concerns about global warming and the environment and their commitments under the Kyoto Protocol have led the Japanese to develop a green building program, called CASBEE, to reduce the environmental footprint of commercial and residential buildings (CASBEE is the acronym for Comprehensive Assessment System for Building Environmental Efficiency). As part of its commitment as a signatory of the Kyoto Protocol, Japan is committed to reduce its emissions of greenhouse gases through a variety of strategies. The Kyoto Protocol was negotiated in Kyoto, Japan in December 1997 and came into force on February 16, 2005 following ratification by Russia on November 18, 2004. The Kyoto Protocol is an agreement under which industrialized countries commit to reducing their collective emissions of greenhouse gases by an average of 5.2% over the five year period 2008-2012 relative to the year 1990 (Wikipedia 2007). Japan, which became the 73<sup>rd</sup> signatory to the Kyoto Protocol on May 31<sup>st</sup>, 2002, has a target reduction of greenhouse gas emissions of 6% over the five year period. As part of its strategy to reduce greenhouse gas emissions, Japan has mandated that new commercial buildings incorporate energy efficiency in their design and operation.

The Japanese government has moved to improve the environmental performance of residential buildings with the drafting of the CASBEE-Sumai (Home) green building program. While the aim of the CASBEE-Sumai green building program is to reduce the environmental footprint of new homes, the program suffers from a weakness in that it is not based on a comprehensive Life-Cycle Inventory of the construction materials used to build Japanese homes. Additionally, the CASBEE-Sumai program has incorporated criteria which arbitrarily place imported wood at a competitive disadvantage by implying that wood harvested from Japanese forests is environmentally preferable to imported wood. These weaknesses of the draft program could be a source of confusion to architects and home builders regarding the overall environmental superiority of wood relative to other structural building materials. The two specific features of concern with the CASBEE-Sumai draft green building program are: 1) the specification of locally sourced wood (obtained from within a specific, but as yet undefined, distance from the building site) as being preferable to imported wood and 2) the determination that

domestic timber is de-facto defined as being sustainable and harvested from sustainably managed forests without independent third-party verification of forest management practices.

The de-facto declaration that all domestic (Japanese) softwood is assumed to be derived from sustainably managed forests runs completely counter to the fundamental premise of sustainable certification: transparency in certification programs, third-party verification and certification based on objective science. The lack of credible third-party verification of sustainability and legality also undermines consumer confidence since there is no guarantee that the wood being used is, in fact, legal or sourced from a sustainably managed forest. For example, a recent report in the Kyodo News (2008) on illegal logging in the Akan National Park in Hokkaido, Japan, illustrates the need for independent third-party certification programs, even in Japan. The decision to define domestic wood as sustainable violates the principal of reciprocity and places imported wood at a cost disadvantage in the marketplace since domestic lumber producers will not have to pay for the cost of certification for their lumber.

The fundamental reason for the preference of domestic wood over imported wood within the CASBEE-Sumai program appears to be to provide regulatory support for domestic wood processors whose lumber products are uncompetitive against imported wood. However, the blame for this lack of competitiveness cannot be placed at the feet of foreign manufacturers but rather at the reluctance of the domestic sawmill industry to implement the measures and investments required to achieve consolidation and modernization within an overly large and technically inefficient industry. For example, the pre-cutting industry, which manufactures the structural components for over 80% of the post and beam houses built in Japan, requires kiln dried lumber that is straight and machined to highly accurate tolerances as a raw material input to their manufacturing process. In response, most imported lumber now arrives in Japan kiln-dried and cut to the demanding specifications required by pre-cut manufacturers. However, despite this change in material specifications within the largest demand segment for structural lumber, the domestic Japanese sawmill industry has been extremely slow to invest in new kiln drying capacity. In fact, by 2007, less than one-quarter of the structural softwood lumber produced in Japan was kiln-dried (22.6%) and only 16.5% of Japanese sawmills had invested in kiln drying facilities. Examples such as this clearly show that Japanese sawmills remain reluctant to invest in manufacturing technology to improve their competitiveness, preferring instead to rely on government regulation and subsidies to provide protection from more efficient foreign producers.

Some organizations in Japan have advocated using the CASBEE-Sumai program to provide preferential consideration for domestically manufactured wood products under the rationale that the increased carbon emitted during the international transport of lumber to Japan increases the carbon footprint of imported lumber, thereby making domestic softwood lumber a more environmentally preferable material. However, this argument overlooks the fact that most container ships carrying lumber products are returning to Japan on a backhaul leg after having delivered Japanese exports to their foreign destination. In addition, the argument for local wood further ignores the fact that ocean transport is an extremely efficient mode of transportation given the large size of the bulk ships used to transport logs and the container ships used to transport lumber. As a result, the amount of carbon emissions for these two transport modes (on a cubic meter per kilometer basis) are just 2.7% and 5.9%, respectively, of the carbon emissions generated from transporting lumber by truck in Japan. Thus, transporting the volume of structural lumber used in the typical Japanese post and beam house (14 m<sup>3</sup>) from North America (either Seattle or Vancouver, BC) to Tokyo generates the same amount of CO<sub>2</sub> as shipping this volume of lumber just 112 km by truck in Japan. This analysis suggests that the international transportation of softwood lumber, at least from North America to Japan, might well produce less of an environmental footprint than transporting domestic lumber given the increase in transportation distance resulting from the widespread acceptance of pre-cut lumber within the post and beam industry. A more detailed analysis of the distribution channels for domestic wood from forest to sawmill to wholesaler to pre-cutting facility to building site should be performed to better understand the carbon trade-offs during transportation between domestic wood and imported wood.

#### *Quantitative Impact of Domestic Wood Programs*

There are two programs that could adversely affect the value of US softwood log and lumber exports to Japan. The first relates to the favorable consideration of domestic wood while the second relates to a program being supported by MAFF that aims to increase the market share of domestic wood use in the P&B industry from its current 30% to 60% by 2015. An economic analysis of these scenarios demonstrates that favoring the use of

domestic lumber would not only impact the demand for imported lumber, but the demand for imported logs as well. Since the US is a large supplier of logs to Japan (approximately 2/3 of which are Douglas-fir logs), this would adversely impact both log and lumber imports from the US. The estimated impact of the domestic wood programs being proposed on the value of US lumber exports to Japan over the 2007-2015 period ranges from \$84.5 million to \$95.6 million. In the case of logs, the value of US exports could potentially drop by between \$196 and \$735 million over the period 2007-2015. The total impact on US softwood log and lumber exports to Japan ranges from \$84.5 million and \$735 million, depending on the success of these programs in promoting the increased use of domestic wood in place of imported lumber and the extent to which imported logs are replaced by smaller, lower quality domestic logs. Considering the current constraints on the ability of domestic timber to substitute for imported timber (e.g., timber supply, lower timber quality and lower mechanical strength properties, among others), it is more likely that the lower estimate of the reduction in the value of US log and lumber exports to Japan (\$84.5 million) is more accurate. While this analysis is sensitive to a number of assumptions, it clearly shows that a program targeted towards substituting domestic wood for imported wood could have a substantial adverse impact on the US forest products industry.

### *Strategic Implications*

The myopic strategy of protecting the inefficient and uncompetitive forestry and sawmill sectors in Japan through preferential regulatory policies (such as the de-facto specification of domestic wood as being sustainable managed) or by providing subsidies to achieve an arbitrary market share for domestic lumber within the post and beam construction sector ignores the superior environmental performance of wood relative to non-wood building materials. More importantly, these types of preferential programs have been specifically targeted to the post and beam market segment; a shrinking segment of the residential construction industry. As a result, these policies distract attention from opportunities to expand the demand for wood products in non-traditional market segments such as wood multi-family housing, hybrid construction and low-rise commercial construction. Housing start statistics clearly show that whereas the ratio of P&B housing starts has been declining over time, the ratio of housing starts in the multi-family (both mansion and apartments) sectors, where steel and concrete dominate, has been increasing.

If the Japanese forest products industry is truly interested in promoting the environmental benefits of wood, encouraging the adoption of a green building program and expanding the demand for domestically produced structural lumber, then they would do well to consider a strategy that grows the overall demand for structural lumber by promoting the increased use of structural lumber in non-traditional sectors of the market rather than encouraging an artificial competition between domestic wood and imported wood within the shrinking P&B segment of the residential construction industry. This promotional effort would utilize LCI data to document the superior environmental performance of wood frame multi-family and commercial (including hybrid) structures relative to non-wood structures. To support this effort, preliminary research should be done to identify: 1) the relative market shares of steel and concrete structural materials within these non-traditional market segments, 2) the material selection process used by architects and builders and 3) the factors that influence the material selection process.

Given the agenda of promoting domestic wood over imported wood, it is important for US wood products associations to maintain open communication with the CASBEE-Sumai committee to reinforce the message that the CASBEE-Sumai program should focus on rewarding the use of any wood over less environmentally friendly building materials. This should be reinforced by the message that wood houses use a broad range of sizes, qualities and wood species in their construction based on specific structural end-use requirements. Limiting the material selection to only locally produced lumber severely restricts the material options available to builders and may encourage them to use less environmentally friendly non-wood materials in place of other “non-local” wood products so that they can still meet the 50% local building material requirement and therefore qualify for prefectural subsidies. The bottom line is that these subsidy and regulatory programs distort the market and could encourage architects and builders to make material choices based not on the environmental performance of a specific material but on a set of artificial proxies that reflect a political agenda rather than objective scientific environmental data.

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