Promotion of Wood in Public Buildings in Japan: Opportunities and Threats

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Overview: Japanese Markets and Competitiveness of the Forestry & Forest Products Industry
Housing starts: steadily declining in the long-run because of the demographic
Japanese Forestry and Forest Products Industry

- Topology and fragmented small forestlands (cable harvesting, chain-saw)
- Inferior species: **sugi** (Japanese cedar)
- Many inefficient “grand-pa & grand-ma” sawmills
- Log markets (doubling transportation cost)
- Poor infrastructure
- Rural job creation is one of the most important political goals; not productivity/competitiveness
- Government (i.e., Forestry Agency) controls EVERYTHING. People believe in regulations and subsidy in Japan.
Internal Rate of Return (IRR) for Forestland Owners

Subsidies helped increase the IRR, but not enough (sugi: +2.7% and hinoki: +2.2%)

*Note that MAFF stopped collecting data after 2000 because of negative trends!*
Forest and Forestry Revitalization Plan: to increase the wood self-sufficiency rate in Japan from 27% in 2009 to 50% by 2020 through a combination of reforms and subsidies.
Japan is the 2nd largest importer of US logs

- US is the largest supplier to Japan (49.8% of log imports)
- 17% of US log exports go to Japan (93.1% were Softwood)
- 85.6% of US log exports to Japan are from the PNW
- 86.8% of US log exports to Japan are Douglas-fir
- Highest unit value of major export markets
Wood-Use Points Program (WUPP)

- In July, 2013 the Forestry Agency implemented the Wood-Use Points Program that awards up to ¥600,000 ($6,000) for new houses where 50% of the wood is “local wood”.

- With a total budget of ¥41 billion (US$432 million), WUPP program could subsidize almost 138,000 wood houses (28% of wooden houses built annually) and displace approximately 1,835,000 m³ of imported lumber.

- WUPP could have cost U.S. forest products exporters as much as $36 million over the 18-month duration of the subsidy program (Eastin and Sasatani, 2014).
WUPP & WTO

**BUT**...To avoid violating WTO rules (imported and locally-produced goods should be treated equally), the Forestry Agency officials made provision for foreign wood to be designated as “local wood” within the Wood-Use Points Program.

**Criteria for designating foreign timber species “local wood”**

1. The timber species must be harvested legally.
2. The forest inventory of the timber species must be increasing.
3. The timber species has “clear and substantial synergistic effects” on the local economy of farm, mountain and fishing villages in Japan.
CINTRAFORE’s Achievement
US Douglas-Fir as “Local Wood” in Japan

- CINTRAFORE, Softwood Export Council, USDA and the US Embassy, Tokyo
- US Douglas-fir: First case to be newly designated as a “local wood” species under the WUPP.
- CINTRAFORE has helped protect U.S. exports of Douglas-fir logs and lumber worth $30 million to $40 million a year.
Forestry Agency’s Solutions for Future
Forestry Agency’s New Solutions

- **Supply of Domestic Wood**
  - 22 million m³ (2013) → 39 million m³ (2020) [+80% ↑]

- **Wooden Biomass**
  - 1.2 million m³ (2013) → 6 million m³ (2020) [X5 ↑]

- **Ratio of Wooden Public Buildings**
  - 8.4% (2011) → 24% (2015)

- Higher Performance Machinery
- Creating More “Green” Jobs
- More Thinning

Forest Agency’s budgetary request for 2015 was 340.9 billion yen (+16.9% from previous year)
Promotion for the Use of Wood in Public Buildings

- “Promotion for the Use of Wood in Public Buildings” act was implemented in October 2010 in order to increase the use of wood by requiring all central, prefectural and local government building projects to either be constructed with wood frame, or at least utilize wood materials in interior applications (e.g., flooring and wall panels).

- The goal of the act is to increase wood use from 7% in 2013 to 24% by 2020. (+ about 750,000 m^3)

- The Wood Use in Public Buildings Law has been tied by both MLIT and FA to the increased use of domestic wood
Wood Frame/ Panels for Med- to Large Scale Buildings

- Japanese 2X4
- Glulam
- Steel/Wood hybrid
- Cross Laminated Timber (CLT)

Because of the strict fire code and building standard law, wood frame was not often used for large scale buildings.

In general, wooden frame can be utilized up to 3-story buildings with less than 3,000 square meters in floor area.
Cross Laminated Timber (CLT)

- January 19th 2014, JAS code for CLT was developed. First CLT building was completed in Kochi Prefecture on March 6th (dormitory of sawmill company made by Meiken). Eight CLT buildings are planning to complete in 2015.

- Forestry Agency collaborated with MLIT and developed “Roadmap to diffuse CLT” on Nov 11th 2014. They are planning to set the general building code by 2016 and hopefully 6% of med-rise buildings use CLT (need to supply about 500 thousand cubic meters of CLT) by 2024 (10 years later).
CLT Road Map

- Design Value of CLT will be announced in 2016. Also, general construction method utilizing CLT will be announced in 2016. No more need to get Ministry’s Approval.

- Fire & char tests done by 2016. CLT may be able to use for quasi-fire zone.

- Developing CLT applications for Non-CLT buildings, such as floor and wall applications.

- Currently, Meiken, Yamasa and Length produce CLT. Production capacity will be about 50,000 m$^3$ by January 2016. Production capacity will be about 500,000 m$^3$ by 2024. Note: 500,000 m$^3$ = 6% (420 units) of med-rise building (3-4 stories) adopt CLT construction methods.

- Educating architects and designer to utilize CLT.
CLT: Great Idea!

- Use more wood for medium- to high-rise buildings. Can replace non-renewable concrete.
- Easy to assemble. Construction schedule will be shortened.
- Concrete projects are labor intensive at job site. May be able to reduce labor and associated cost of building.
- Wooden Buildings: 22 years depreciation. Great tool to avoid estate tax.
- More importantly, they can harvest more inferior sugi! Can revitalize forestry industry in Japan!!
CLT: Skepticism

- Fire code won’t change. Cannot build buildings taller than 4 stories unless passing 2-hours fire proof test.
- Sound proof? Fire safety (especially jointing parts)?
- Concrete industry is politically powerful with LDP.
- Steel is no more very expensive.
- Enough designers and architects? They especially need wooden structural engineers (Schematic Design).
- How about the cost of CLT building?
- They even didn’t build med-sized 2X4 buildings.
- Can government really make a market? Are they going to spend more tax payers’ money?
- Do you have enough economically feasible sugi resource to produce all CLT buildings?
If CLT market launches as FA expects: Lamstock needed

- Most likely they will use European whitewood (Norway spruce) as imported species. They may not be able to use SPF because JAS is species-specific (may change).
- How about Douglas-fir and Western hemlock? How about hybrid CLT? How about utilizing pressure treated lamstock? A lot of ways to develop innovative products. Need to start researching about this opportunity.

Lamstock: Thickness 12-50mm; width 300mm or less
E1: DF, SYP, Western larch
E2: hinoki
E3: Western hemlock
E4: spruce, lodgepole pine, fir
E5: sugi, Western red-cedar
Public Buildings seems a good opportunity, but....

- Usually, local government that builds public buildings usually would like to use lumber from their own region.

- Or, they would like to build a building as cheap as possible.
Changing expected

- Emerging some virtually integrated competitive sawmills (from mountain to glulam/CLT factories)
- Pre-Cut factories will introduce machine which can process large dimension glulam or even CLT.
  - A lot of inefficient sawmills and small pre-cut factories will go out of business.
- Large pre-cutters and Engineered Wood manufacturers may play “general contractors’” role for wooden building projects.
- Construction industry will be reshaped.
- FA will aggressively promote domestic wood (i.e., sugi) for engineered wood products.
Future Forecast
Forecast of Japanese Market

- **Residential Housing Market:** Steady but long-term declining

- **Med- to High-rise Non-Residential buildings:** Starts using more wood, but testing driving market

- **Short-term:** Japanese building market is OK

- **FOREX:** Further JPY depreciation or Strong US Dollar
  - Huge national debt, but more spending
  - But, not possible to reliably forecast FOREX.
Global Economy: Markets are Correlated

- **Strong US Dollar**
  - Yellen removed “patient” from FED’s policy statement
  - Believe or not, US economy is doing really well
  - Asset appreciation
  - Commodity depreciation
  - Unwinding USD Carry Trade from emerging economies

- **China**
  - Construction sector is slowing down

- **Canada**
  - Relying on depreciated commodity
  - Housing markets: relying heavily on Chinese buyers