

Project Statement

BC Coastal Forest Sector Development Initiative

Program	Harvesting and Conversion Program – Solid Wood and Residual Products
Project Title	Identification of Best Practice Manufacturing Technologies
Project Number	H.03
Project Leader	Darrell Wong
Project Team	Forintek (LMD, Markets, Resource), Feric (Harvesting), Paprican (residuals), UBC, machine suppliers and consultants
Start Date	October 1, 2007
Completion Date	Phase 1-Mar 2009, Phase 2-Dec 2009, Phase 3-Jun 2010, Phase 4-Jan 2011, Phase 5-Sept 2011

Rationale:

The BC Coastal industry's historic success was largely built on the superior fibre quality and unique product attributes of species found on the coast such as western red cedar (WRC) and large old growth western hemlock. Unfortunately, the availability of WRC has dropped by more than 50% and there is now a much larger proportion of smaller, lower grade hemlock logs in the fibre basket. At the same time, competing products from Europe, South America and Asia have successfully substituted in segments traditionally served by western hemlock, weakening the perceived uniqueness of this species in some applications. When these issues are combined with the older equipment and technology and the high manufacturing costs of coastal sawmills, the challenges facing the BC Coastal industry become substantial.

From an industrial perspective there are at least two possible approaches to address the problems on the BC Coast. The first is to improve current processes/practices (machines and technologies) to minimize costs and maximum value recovery - likely the best short-term approach since many improvements can be made quickly and at low cost. This approach is the focus of project H.02-Identification of Key Barriers and Opportunities in Solid Wood Products Manufacturing. The second approach is to adopt best practices from around the globe in forest products and in other manufacturing industries and apply these practices to re-design the BC Coastal industry. This latter approach is the focus of project H.03.

Key Objectives:

1. Identify best practice manufacturing technologies and methods from around the globe and across industries that are applicable to the BC Coastal solid wood products manufacturing sector
2. Prioritize best practices based on potential benefit, risk and payback
3. Technology transfer of best practices with identified benefits and ROI
4. Analyze and project of industry wide benefit of best practices

Project Methodology:

Project H.03 will be conducted in 5 phases over 5 years.

Phase 1 - Phase 1 will identify best practice manufacturing technologies and methods that are appropriate for the coastal sawmilling industry. Two current sawmilling technology hot spots are Europe and South America, which will both be examined for cluster manufacturing, automation technologies, scanning, real-time communication and tracking systems. This identification process will be conducted in consultation with manufacturing and forest industry experts from around the world. Interviews will be performed to short list best practices for analysis. Detailed information will then be gathered on each and, where possible, site visits and preliminary studies will be performed. Scenarios will then be identified for each best practice on how it might be appropriate and utilized in the coastal industry.

Phase 2 - Phase 2 will focus on analyzing and prioritizing the best practices collected in Phase one to determine the potential benefits of utilizing tools such as Optitek and linear programming optimization to assess manufacturing capabilities. In the short term, simplified models will be developed, including a basic log allocation model to allow examination of the appropriate logs for each mill and the effect of the current sawmill technology and cost structure on industry profitability. These models will allow the analysis to begin and to guide the first rounds of industry recommendations. Longer term work will require the development of decision support and planning systems suitable for the coastal industry. These systems will incorporate resource growth and yield predictions, harvesting, log delivery, manufacturing and customer demands. A key focus of these systems will be their flexibility and adaptability, which will enhance a mill's ability to access new markets. A key challenge will be to incorporate the internal attributes and visual grading requirements unique to the coastal resource.

Phase 3 - Phase 3 will focus on the economics of the identified best practices, determining which offer the highest potential benefits and lowest technical risks to the coastal industry. Product value, volumes, markets and their realistic potential of each will be assessed in collaboration with the Products and Markets team. The developed decision support and planning systems from Phase 2 will be applied to examine business models on the BC Coast, with potential redesigns of the industry.

Phase 4 - Phase 4 will focus on technology transfer and the verification of the projected benefits and ROI. A go/no-go decision on technology transfer will be made in consultation with industry partners and co-operators.

Phase 5 - Phase 5 will focus on the development of log allocation decision support and planning tools for the BC Coastal industry. These have been identified as a high priority by Western Forest Products.

Project Milestones:

Activities	Planned Completion Date
Preliminary report on identified best practices for the coastal industry, summary of conducted interviews and assessed values	March 2008
Phase 1 Completion – Identification of best practices and technologies that could be adapted for solid wood products manufacturing in South America	March 2009
Preliminary log allocation system	August 2009
Phase 2 Completion – Prioritized list of best practices based on estimated payback using preliminary log allocation system	December 2009
Detailed log allocation tool based on one sawmill	March 2010

Activities	Planned Completion Date
Phase 3 Completion - Identification of financial opportunities and technical risk leading to go / no-go decision for barrier removal technology transfer	June 2010
Phase 4 Completion – Industrial trial of best practices implementation, analysis of benefits, determination of ROI and projection of industry wide benefit	January 2011
Report with industry wide guidelines for implementation and adjusted benefits for major segments of the coastal industry	March 2011
Detailed log allocation tool based on multiple sawmills	May 2011
Phase 5 Completion – BC Coastal solid wood industry decision support tool	September 2011
Report on transformative business model assessments for the BC Coastal solid wood industry consider industry wide implementation of best practices and planning systems	December 2011

Key Deliverables:

1. Prioritized list of best practices appropriate for the coastal industry with:
 - a. Detailed information on the technologies / methods
 - b. Methods on how the best practice would be utilized
 - c. Analysis of the benefits and risk
2. Financial opportunities of best practices implementation
3. Industrial trial with analysis of benefits, determination of ROI and projection of industry wide benefit
4. Preliminary log allocation decision support tool
5. Single sawmill detailed log allocation decision support tool
6. Multi-sawmill detailed log allocation decision support tool
7. Coastal solid wood industry decision support and business case analysis tool

Expected Long-term Outcomes:

Improved industry competitiveness through:

1. Lower operating costs
2. Increase labour productivity
3. Capability of faster capitalization of market and product opportunities
4. Increased operational reliability
5. Improved ability to adapt to changing global industry economics and market/products shifts
6. Improved tactical and strategic decision making

Potential Impact:

The implementation of best practices can have fundamental effects on businesses and industries. Other businesses and industries that have successfully implemented best practices such as information & communication systems, logistics/distribution and food processing have experienced operating costs reductions by 25-50%, labour productivity increases by 20-100% and increases sales of up to 100% or more. Businesses that have successfully adopted these best practices such as Stora Enso, Toyota, Ikea and Walmart have become the industry leaders in their sectors.

Collaboration:

Work on this project spans most of the value chain and as a result, coordinating with other project is critical. This project has planned interaction with 6 other projects and close collaboration with the University of British Columbia. Expertise from other research groups such as IVALSA in Italy and the University of Bio Bio in Chile will also be utilized.

Key information on the coastal Hem-Fir resource, Optitek development and products and markets necessary for the development of decision support and planning tools will be provided by:

- R.01 - Characterization of Hem-Fir Attributes In Terms of end-Product Potential
- H.04 – Resource Conversion Valuation Tools
- P.03 – Gap Analysis, Market Studies and Demonstration Projects of the BC Coastal Products

Two parallel projects examining the barriers and opportunities in harvest operations and log delivery will be carried out by:

- H.01 – Identify and Demonstrate Opportunities to Improve Efficiency of Fibre Delivery
- R.06 – Provide Strategic and Operational Tool to Assess Economic Operability of BC Coastal

A parallel project is planned to best practices in chip quality and its affects on pulp and paper product quality.

- H.06 – Demonstrate Effect of Modern Sawmills on Chip Quality

A parallel project is also planed in the development of an industry wide strategic planning and decision support tool.

- H.08 – Decision Support Tools for Industry Competitiveness

Dr. Thomas Maness and his research group at the University of British Columbia (UBC) will be major collaborator on the project. In the initial phases of the project, Dr. Thomas Maness will be identifying best practice manufacturing technologies in South America and Europe. His connections with universities in these regions allow him unprecedented access to sawmills, equipment manufacturers and decision makers within government and industry. In the latter stages, Dr. Maness and his research group will be developing decision support and planning systems to allow assessments of the best practices and new BC Coastal Industry business models. H.03 will provide support for PhD student, masters students, post docs and optimization programming support. These funds will be leveraged with NSERC funding awarded directly to UBC.