Project Statement

BC Coastal Forest Sector Development Initiative

Program	Bioenergy and Biorefinery
Project Title	Assessment of Economically Available Biomass
Project Number	B.02
Project Leader	Jack MacDonald
Project Team	Tony Sauder, Mark Ryans, Paul Bicho
Start Date	October 1, 2007
Completion Date	March 31, 2009

Rationale:

Today, the coast forest industry creates much of the energy it requires from residues produced during the wood conversion and manufacturing processes. Opportunities may exist in the future to increase the use of wood biomass for additional power to the utility grid; heat for industry, institutions and residential housing; bio-chemicals; and ethanol. However, for the products produced to be competitive with other forms of energy inputs, the forest residues must be delivered to the utilization facility at an acceptable cost, meet quality specifications, and be continuously delivered throughout the year.

An expanded or new wood biomass utilizing industry may provide opportunities to recover residues that accumulate all along the forest product's supply chain and that cannot be efficiently utilized by the pulp and paper sector. In many cases, costs are incurred to move the residuals from where they accumulate.

Hemlock and amabilis fir may also have unique fibre properties that provide new market opportunities for specialized biochemicals to be produced in a biorefinery in combination with an existing pulpmill or as a stand-alone plant. An expanded biomass utilization industry may also provide a market for a large volume of low-grade fibre that may be generated from a renewed coastal solid-wood sector, and a greater portion of high quality, more consistent fibre can be directed to the pulp sector.

For investment to occur in a coast bio-industry based on woody residues, the current industry and new investors need to know how much wood biomass is currently and potentially available as feedstock, its characteristics, and the costs to deliver it in the form required to a utilization facility. The existing pulp industry needs to know how the new industry can potentially utilize the same fibre basket in a way they can both co-exist and benefit. This project will produce an inventory of the forest biomass that could be generated from harvesting operations, sortyards, and legacy piles on coastal BC, including their production cost, distance from a loading terminal or main transportation centre, and other attributes.

Key Objectives:

- Estimate the volume (ODt) of forest biomass available at roadside harvesting operations (private and tenure lands) by forest type.

- Estimate the volume (ODt) of woody biomass available at sortyards, mill yards and legacy piles.
- Stratify the available volume by distance from a loading terminal or main transportation centre.
- Quantify the moisture content and size characteristics of the residues, and its contact with salt water.
- Identify the various recovery, comminution and transportation strategies and equipment that could be utilized to produce a desired product and deliver it to a utilization facility, and estimate the range of costs.

Project Methodology:

1. Consult FPInnovations member companies, including BC Timber Sales, to develop a classification system of forest types related to their biomass-production potential.
2. Evaluate other existing biomass inventories (e.g., from Murray Hall) to determine whether they are applicable to this project's requirements.
3. Survey FPInnovations coastal members, including BC Timber Sales, on their harvesting plans for the next 20 years and locations of currently non-utilized residues, sortyards, and legacy piles.
4. Measure the volume of roadside harvesting residue in sample cutblocks from representative harvesting systems using the forest type classification system, and at sortyards and legacy piles. Develop bulk-density conversion factors by measuring bulk volume and weighing the material in a dump truck.
5. Identify challenges for transporting biomass from the harvest site to a loading terminal or main highway, and terrain characteristics and residue placement that will dictate residue recovery methods.
6. Suggest strategies for changing or modifying log extraction that improve the efficiency of residue recovery and extraction.
7. Estimate the volume of roadside, sort yard and mill yard residues that can be derived from the projected 20-year harvest activity, and the distance away from a loading terminal or main highway.
8. Produce a spreadsheet template to estimate the volumes and costs for delivering forest feedstocks to a specific utilization facility.

Project Milestones:

Activities	Planned completion Date
Complete classification of annual and 20-year harvesting plans from companies and BC Ministry of Forests and Range classified by forest cover type and distance.	June 30, 2008
Continue sampling cutblocks for residue bulk density and bulk volume of roadside residue.	October 31, 2008
Measure bulk volume of legacy piles.	October 31, 2008
Develop coastal biomass model or provide input into an existing model.	March 31, 2009

Key Deliverables:

- A data base of current residue generated by harvest method at four different biogeoclimatic sub-zones, sortyards and legacy piles.
- An estimate of the volume of roadside harvesting, sortyard and mill yard residues that may be available from 2008 to 2028, the distance they occur from a loading terminal or major highway, and the estimated costs to recover and transport.
- A template to identify the costs for delivering a specified volume of woody biomass, for a specified period to a designated facility.
- Recommendations on potential changes to harvesting operations that may reduce the cost or improve the quality of delivered biomass.

Expected Long-term Outcomes:

- Forest harvesting and forest management: costs to remove and/or landfill wood residues can be eliminated; more volume to offset development and overhead costs; increased work year.
- Solid wood products and panels sectors: higher quality logs; cost recovery for low-value logs at the stand level and residues produced at the mills.
- Pulp and paper sector: more uniform, higher quality wood fibre because low-quality fibre can be directed to other markets.
- Provincial government: greater utilization of the hemlock amabalis fir resource; increased revenues; new capital investment.

Potential Impact:

- The provincial government, forest industry sectors and investors will have the information required to make investments in new facilities that can utilize forest residues.
- Overall quality of fibre delivered to a conversion facility should increase; a greater portion of the hemlock and amabilis fir resource can be accessed; and overall costs to deliver fibre to all sectors of the industry should decrease.

Collaboration:

1. External contacts
    - FPInnovations member companies and BC Ministry of Forests and Range on Vancouver Island will continue to be the major external cooperators.
    - Corporate divisions of the cooperating companies will continue to be consulted when developing the forest cover type classification system.
    - Murray Hall and Jim Garvin have expressed an interest in providing assistance on BC coastal fibre flow information.
2. Internal contacts
    - Tony Sauder, Mark Ryans, Bjorn Andersson, Colin Campbell and Marv Clark – Feric
    - Paul Bicho and Tom Browne - Paprican
3. Linkages to other projects
    - Products and markets program: provide information on the costs for delivered fibre to assess new opportunities.
    - H.01 – Identify and demonstrate opportunities to improve efficiency of fibre delivery.
    - B.01 – Bioenergy and biorefinery opportunities for the coastal BC forest sector.