

## Technical Reports

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BC Coastal Forest Sector Hem-Fir Initiative

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### Fast Pyrolysis Study – Biomass Sourcing and Pyrolysis Trials Status Report

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<b>Program:</b>	Bioenergy and Biorefinery	<b>Project No.:</b>	B.04
<b>Project Leader:</b>	Douglas R. Bull	<b>Date:</b>	August 2012

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#### Abstract

This study investigates the fast pyrolysis process applied to biomass from three tree species found along the coastline of British Columbia. Hog fuel from Douglas fir and Hemlock fir, plus sawdust from Western Red cedar were run through a fluidised bed and a mechanically stirred pyrolysis reactor system. In preparation for the tests, the raw biomass samples were ground to reduce their particle size to an average of 500 microns, followed by drying to 1-3 wt% moisture content. The pyrolysis oil, char and gas yields were 55-64 wt%, 20-27 wt% and 16-18 wt% respectively in the fluidized bed reactor system. The mechanically stirred reactor system had slow biomass heating rates and generated oil, char and gas yields of 16-42 wt%, 34-56 wt% and 21-33 wt% respectively. Wood consistently had higher oil yields than the hog fuel samples. The pyrolysis products were extensively characterised with proximate, ultimate, calorific value, trace elements, minerals, metals and halide analyses. The calorific value tests revealed that the raw pyrolysis oil has a similar heating value to that of dry biomass of 18-19 MJ/kg. The char had the highest heating values of 25-28 MJ/kg, and the pyrolysis gas the lowest at 10-11 MJ/kg. Work is ongoing to further characterise the pyrolysis oil, looking for potentially valuable chemicals and tracing ions from marine salts through the pyrolysis process.

**Keywords:** Pyrolysis, British Columbia, Hog Fuel, Marine Salts, Char, Oil, Gas, Coastal

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