

A Multi Region Development of the FLAMES Model to Simulate Trade in Biofuel and Conventional Timber Products Resulting from Policy Driven Land Use Change

Aroon Parshotam and Nicolas Robidoux

Landcare Research Ltd., New Zealand

and

Peter Read

Massey University, New Zealand

P.Read@massey.ac.nz

Work is in progress to develop policy relevant versions of two models described in Read, 1999. CASC (Carbon Absorption Supply Curve model) is data intensive, making use of the IMAGE 2.0 data base to develop time-horizon and land-take-up related carbon absorption curves for two land use change activities. These are long rotation sequestration and short rotation biofuel production each on a global basis and broken down by regions (based on the OECD GREEN model regions). FLAMES (Fuel/Food/ Fibre Land Allocation Model for Energy/Environment Sustainability) is a highly parameterized global model for studying dynamic market interactions resulting from pro-active land use change policy. The focus has been on a 'buffer stock' concept in which carbon is initially sequestered in a long rotation with the land subsequently used for intensive biofuel production, as energy sector demand for biofuel raw material grows. A parallel paper (Parshotam and Read, 2000) reports progress with adapting the CASC model to generate country-level carbon absorption supply curves under exogenous world price determination for trade in biofuel products, conventional forest products and project based carbon certificates. The present paper describes work to elaborate the FLAMES model into a multi-region version with trade. The objectives are (a) to generate the exogenous world prices required for the parallel paper and (b) to demonstrate the potential synergy between sustainable energy sector development and export led growth for land rich but otherwise impoverished developing countries through the export of liquid fuels processed from biofuel raw material.

References:

Read, 1999. "Carbon Sequestration in Forests: Supply Curves for Carbon Absorption", USDOE/IEA workshop on 'Promising technologies for mitigating greenhouse gases', Washington, DC, May (see website <http://www.iea.org/workshop/engecon>).

Parshotam, Robidoux and Read, 2000. "Using GIS data for country level carbon absorption curves under pro-active land use change policies in a market driven environment: the New Zealand case", paper to "Sustainable Energy: New Challenges for Agriculture and Implications for Land Use" an International Conference, Wageningen University, May 18-20, 2000.