Robert Helleur, J Fundam Renewable Energy Appl 2017, 7:9(Suppl)
DOI: 10.4172/2090-4541-C1-043

2nd Euro Global Summit and Expo on

BIOMASS AND BIOENERGY

October 12-13, 2017 London, UK

Robert Helleur

Memorial University of Newfoundland, Canada

An integrated thermochemcial biorefinery for maritime forests

Biorefining is defined as the sustainable processing of biomass into marketable products and fuel. In the Canadian Maritimes waste biomass can be readily obtained from forestry and fishery sectors and municipalities (solid wastes). The integrated forest biorefinery consists of the addition of biorefining units to pulp and paper mills and local sawmills while maintaining the manufacturing of their core product. The biorefinery would provide a source of sustainable fuels and chemicals while increasing the value from wood residues and help diversify the sector. Processing woody biomass into fuels is the first step in biorefining, similar to the atmospheric distillation unit at an oil refinery or inlet separator at a gas plant. Over the last 4 years Memorial has partnered with BioFuelNet Canada, CSFI/DNR and Abritech (Quebec) in developing a comprehensive thermochemical research facility which includes a pilot scale fast pyrolysis unit (450-480°C;no O_2). Pyrolysis converts biomass into liquid biofuel, biochar and useful chemical products. Given the average residues of a medium sawmill i.e., 3,500 tonnes/yr and the potential for other feedstocks (fishery) a number of integrated pathways are being considered (Figure 1). The bio-oil has the potential for a replacement or blend with heating oil for the sawmill and region. Depending on scale of the system there are opportunities to partner with other users such as pulp and Paper mills. The biochar product has a number of local markets including soil amendment and as an effective absorbent in the mining and oil and gas industry. Other integrated processes under development are torrefaction (300°C; no O_2), a pre-treatment leading to higher quality products.

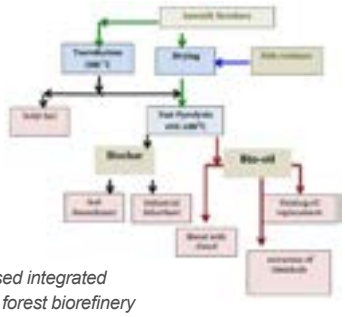

Figure1. *Proposed integrated thermochemical forest biorefinery*

Biography

Robert Helleur is a Honorary Research Professor of Chemistry at Memorial University. He has been very active in the field of analytical pyrolysis since 1986 in the area of thermochemolytic analysis of chemical markers/ profiling of carbohydrates, lignins, tannins, lipids and plant stressors in biomass and soils. A shift in research focus occurred in 2010 towards applied pyrolysis of forestry residues and municipal wastes with research funds from NSERC, NCE (BioFuelNet), and CFSI/Forestry. Pyrolysis experiments are conducted at lab- and pilot-scale and comprehensive analysis for the biochar and bio-oil products undertaken using various feedstock compositions. Biochars has been used in greenhouse studies for plant growth studies while crude bio-oils have been studied for their chemical stability and extraction of useful chemicals. Dr. Helleur has supervised over 60 graduate students and has published over 75 peer-reviewed research articles. He has been active member in a number of pyrolysis workshops and international conferences.

rhelleur@mun.cay