

BIOENERGY SYSTEMS & BIOREFINERY



Theme leader:

Dr. Xiaotao (Tony) Bi tony.bi@ubc.ca

Dr. Jack Sadler: jack.saddler@ubc.ca

Our goal:

- Research, develop, scale up, demonstrate and deploy key clean technologies for the production of renewable bioenergy and biofuels from waste cellulosic biomass.
- Promote joint research, innovation, development and demonstration of bioenergy products and technologies with partners from industry and academia all over the world.

Developing Low Carbon Renewable Fuel from BC's Forest Sector Residues

- There are estimated 30 million tonnes of forest residues available each year at British Columbia, which can be converted to high-value biofuels or biochemicals.
- This project will advance new clean technologies for biomass conversion to syngas, as a low carbon biofuel.
- We produce fuel in a gasification process followed by syngas cleaning and upgrading.
- Project outcomes will provide technical design information for the construction of a commercial-scale demonstration plant (~500 GJ/day) at a BC pulp/paper mill.

Microwave-assisted Pyrolysis of Biomass In a Pulsed Fluidized Bed

- In biofuel production process, the low quality of bio-oil and biochar imposes challenges. Usually, produced biooil has high oxygen content, high acidity and high viscosity of produced biooil, which are not favorable. The poor quality of biochar also surrenders its use as fertilizer for soil applications and as a reducing agent in metallurgical processes
- Microwave-assisted catalytic pyrolysis process has shown to improve the biooil/biochar quality
- Our microwave-assisted pilot-scale reactor is equipped with a unique pulsed fluidized bed and a 12" packed bed condenser to extract biooil.

Our projects directly align with Canada's objective to increase clean tech jobs, make the resource sector more sustainable, and help meet Canada's GHG reduction targets.

