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Process Engineering

## Research Area

### Heat-Thermo-Fluid

- Heat transfer and cooling in gas turbine
- Heat transfer enhancement of impinging jet from pulse jet combustion
- Impinging jet, pulsating flame jet
- Heat transfer enhancement in channel flow by rib, pin, wing, dimple and protrusion
- Aerosol Mechanics using CFD and experiment

### Renewable Energy and Combustion

- Development of energy efficient furnace for biomass combustion
- Pelletization / Fluidized bed combustion for biomass pellet fuel
- Gasification burner
- Solar thermal dryer/ Solar-Biomass hybrid dryer
- Pulse jet combustion for hot air jet generator
- Development of an electrostatic precipitator for collection of particles from rubber wood combustion
- Upgrading solid biomass heating value by torrefaction

- Wind energy potential/Low wind speed wind turbine
- Solar energy for thermal processes
- Bio-hythane production

#### **Biodiesel production**

- Development of new biodiesel production system for reducing biodiesel processing time (Batch/Continuous processes)
- Testing of biodiesel oil on modern diesel engine
- Continuous biodiesel production from crude palm oil by using ultrasonic/ static mixer
- Alcohol recovery from biodiesel production
- FFA reduction from crude palm oil in biodiesel production

#### **Drying Technology**

- Design energy efficient smoking room for rubber sheet drying using CFD technique
- Jet impingement dryer/ Spray drying
- Heat pump drying
- Microwave drying
- Solar drying
- Hot air and infrared drying
- Drying kinetics study

#### **Energy conservation in buildings and industries**

- Industrial Energy Management
- Energy saving home/ low energy house
- Reduce the load of air conditioning
- Study of the solar collector for hot water generation system
- Applications of solid desiccant for dehumidification
- Parametric study for thermal comfort through the use of radiant cooling system
- Thermal comfort study

#### **Energy and Environment**

- Treatment of waste water from biodiesel plants using microbiological reactor
- H<sub>2</sub>S removal by biofiltration
- Bio-desulfurization of biogas
- Bioethanol production
- Reduction of greenhouse gas emission from palm oil mills
- Monitoring of organic pollution contaminant in treated wastewater
- Potential conversion of plastic waste in old landfill to fuel
- Municipal solid waste management
- Energy consumption load demand forecasting
- Battery charger for low power applications