

INSD NanoScience Seminar (No.7)

Title: **Sustainable Energy Production Towards Low Carbon Economy**

Lecturer: Prof. Abdul Rahman Bin Mohamed (School of Chemical Engineering,
Engineering Campus, Universiti Sains Malaysia)

Date and Time: Thursday, July 12th, 2012, 15:00-16:00

Place: Graduate School of Engineering Science, Building G, Room G217

Abstract:

Low Carbon Economy (LCE) is a concept that refers to an economy which has minimal output of greenhouse gas (GHG) emissions into the biosphere, especially carbon dioxide (CO₂). LCE Research Group is a research team that gathers the researchers from different fields and research institutions in Malaysia, working together towards creating low carbon economy in Malaysia. The research works carried out including quantification and evaluation of carbon footprint of agro-based bio-fuels and conventional fossil fuel, CO₂ capture and utilization, solid bio-fuel from biomass utilization in coal-fired power plant, and socio-economic impact study of sustainable energy production towards low carbon economy. The research program is started in 2011, and now many research projects are in progress. Nano-sized adsorbents have been synthesized for CO₂ capture and it is proven to give higher adsorption capacity than its ordinary commercial grade material. Also, nanocatalysts have been synthesized to convert CO₂ to some useful chemicals, such as syngas and methanol. Besides that, the research of photocatalytic reduction of CO₂ is also being carried out. The process can be applied to utilize CO₂ into useful hydrocarbon products, such as methane, methanol and other valuable chemicals. at lower energy consumption compared to the conventional thermochemical reaction. In our future direction, we look forward to applying First Principal Calculation to conduct fundamental study on thermodynamic properties, kinetic properties, electronic structure, and spectroscopy, in order to understand the mechanism behind the process.

Just after the seminar, there will be held a small farewell tea party to stimulate mutual communication with Prof. Rahman. (16:10-17:00)

Reference: Prof. T. Itoh, Institute for NanoScience Design, E-mail: itoh@insd.osaka-u.ac.jp