

# Energy & Environmental Systems Engineering

Energy related activities could result in a series of environmental issues, such as air pollution, greenhouse gas emission, ground water and soil pollution. Li's research efforts are focusing on energy-environmental systems management modeling, petroleum pollution control, water environment management and climate change adaptation. In addition, R & D efforts have also been made for supporting water governance in developing countries.

## Integrated Energy-Environment Systems Management

Three aspects of work have been conducted : a) Development of GHG-mitigation constrained energy systems management models under uncertainties, with a case study for Alberta's GHG-emission management; b) Development of evacuation and air pollution management model; c) Design and installation of Saskatchewan Air Monitoring Lab. Nine journal papers have been generated in the field.



## Petroleum Pollution Control

Ground water/soil are polluted in many petroleum transmission and storage sites. A series of simulation and management studies and technology developments were carried out for ground water/soil remediation in petroleum pollution sites at Coleville in Canada and Liaohe in China. Through these researches and developments, several remediation techniques were developed with relevant patents granted.



## Water Governance

As a member of the UNDP Expert Workstation, I have been participated in a series of Water Governance Projects, which have been conducted in Heilongjiang, Xinjiang, Tianjin, Henan, Zhejiang, Sichuan and Guangdong of China. Collaborations have been undergoing among UNDP, Coca Cola, and various research institutions, industries, multi-level governments and multiple stakeholders. The projects cover water replenishment, water safety and water resource management.



## Water Environment Management and Adaptation Study

Eutrophication has been a common challenge for ecosystem's health of many water bodies, especially those in Saskatchewan. Meanwhile, climate change is posing uncertain impacts on the water ecosystems. Relevant modeling studies have been conducted for addressing such issues in the Willow Lake at Assiniboia, and the Buffalo Pound Lake at Moose Jaw, Saskatchewan.

