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## Editorial

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Recently, there has been growing concern on various risks in the global energy market. Managing risks in the energy market is essential to maintain sustainable development. Risks are inherent in business. It is believed that without risk there would be no motivation to conduct business. A key principle for optimising risk management is that organisations should accept those risks that they are competent to deal with, and 'outsource' other risks to those more competent to deal with them (Wu and Olson, 2009a, 2009b). Quantitative tools are important to assess risk, enabling better informed managerial decision making. This special issue is intended to present state-of-the-art work that demonstrates tools to treat energy, risk and uncertainty. Both theoretical and applied work is welcome.

We are very pleased at seeing the special issue of *International Journal of Global Energy Issues (IJGEI)*. This special issue is intended to present state-of-the-art work that demonstrates tools to manage risks and uncertainties in the energy sector.

Our call for papers seeks new contributions addressing the use of various management tools in managing risks and uncertainties in the energy sector and related topics. This special issue includes the broad coverage we were seeking, with both theoretical and empirical studies related to energy, risk and uncertainty using optimal control models, transaction cost theory, neural networks, support vector machine, stochastic frontier analysis and data envelopment analysis.

It was believed that R&D spending is not just influenced by various uncertainties, but also by the technology options the firm has to choose from or chooses to invest in. The first paper titled 'A control model of policy uncertainty and energy R&D investments', by Shittu and Baker considers an optimal control model to determine the effects of uncertainties in a carbon tax on a firm's abatement capital stock and R&D spending in alternative, cost-reducing, non-carbon energy input technology. The authors research find that near-term investments decrease in risk in the magnitude of a carbon tax, but increase in uncertainty in the timing of a carbon tax.

Chevallier examines the problem of energy risk management with carbon assets, introduced in January 2005 as part of the EU Emissions Trading Scheme. He developed a mean-variance optimisation and portfolio frontier analysis by use of energy market data from April 2005 to January 2009. The author's interesting work features an expected return of 3% with a standard deviation  $< 0.06$  by introducing carbon assets – carbon futures and CERs – in a diversified portfolio composed of various derivatives from the energy market.

Emerging economies such as China is entering a rapid developmental stage of urbanisation characterised by tremendous economic development. He et al. employs data envelopment analysis (DEA) and stochastic frontier analysis (SFA) to analyse city input-output efficiency including electric power input factor for China's typical cities. The authors' research work leads to interesting suggestions for the improvement of the city power input-output efficiency in.

The special issue concludes with a discussion on environmental impact assessment of thermal power plant by Niu, Wang and Wu. The thermal power plant burns a large amount of fossil fuels and discharge pollutants which cause serious atmospheric pollution. The authors develop an assessment model to accomplish this task by integrating the support vector machine and the BP networks based on particle swarm optimisation are presented.

## References

- Wu, D.D. and Olson, L.D. (2009a) 'Introduction to the special section on 'Optimizing risk management: methods and tools', *Human and Ecological Risk Assessment*, Vol. 15, No. 2, pp.220–226.
- Wu, D. and Olson, D.L. (2009b) 'Supply chain risk, simulation and vendor selection', *International Journal of Production Econ* (in press).