

Modeling for energy and environmental risk management

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Abstract:

Canada's energy sector is subject to the country's commitment of carbon-emission mitigation in the Paris Agreement. The transition to cleaner energy options in Canada will result in severe socio-economic and environmental effects. A cooperative approach for the country's decarbonization pathway is vital to achieve a more efficient and cost-effective GHG mitigations. This study is to develop energy and environmental risk management models to reflect trade-offs between minimized emission-abatement costs and maximized economic revenues. Specifically, interval, fuzzy and stochastic programming methodologies will be developed to reflect uncertainties and associated environmental and economic risks. GHG emissions from various sectors from thirteen Canadian provinces and territories under multiple scenarios will be analyzed. Issues of carbon taxes, abatement technologies, and economic effects will be addressed. The results are valuable for supporting the formulation of national policies for carbon-emission mitigation.