

Technology and Policy Options for a Low-Emission Energy System in Canada

Miroslaw Romanowski Lecture, Royal Society of Canada

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Abstract

A synopsis is presented on the key findings of the Council of Canadian Academies' Expert Panel Report on energy use and climate change, which was released in late October of 2015. The evidence is clear: increased greenhouse gas emissions from human activity are causing pervasive changes to the Earth's climate, and significant and rapid efforts will be needed to reduce these emissions in the coming decades. The Panel's report is an up-to-date, accessible review of options for reducing greenhouse gas emissions and moving Canada toward a low-emission future. It provides an overview of Canada's energy system, an analysis of different energy sources and technologies, and an exploration of the public policies available to support a shift toward low-emission energy sources and technologies. Moreover, the investigation is guided by a systems thinking approach, recognizing the interconnectedness of society and the natural environment supporting it. Overall, the Panel acknowledged that the technologies needed for moving toward a low-emission energy system and the policies required for promoting the use of those technologies, already exist, are well-understood and are constantly improving. Optimal strategies and policies for advancing reductions in greenhouse gas emissions will need to be adaptive by evolving as necessary in response to emission trends, new technological developments, and other social, economic, and political changes. They will also benefit from system level principles of resilience, sustainability, fairness, and integration across jurisdictions and disciplines. The report constitutes an indispensable resource for private sector decision-makers, different levels of government, and the public as they seek to better understand energy use and the options available to combat climate change.

Acknowledgement

This seminar presentation is entirely based on the following Expert Panel Report, which was orchestrated and published by the Council of Canadian Academies (CCA) located in Ottawa, Ontario, Canada. The Expert Panel consisted of a multidisciplinary group of eight experts, for which K.W. Hipel and P.R. Portney were the Co-Chairs, as well as an Assessment Team from the CCA. Magna International Inc. kindly funded the project.

Expert Panel Report

Council of Canadian Academies (CCA), “*Technology and Policy Options for a Low-Emission Energy System in Canada*”, Report of the Expert Panel on Energy Use and Climate Change, Report released on October 27, 2015, by the CCA, Ottawa, Ontario, Canada K2P 2K3, 2015.

(This report can be downloaded free of charge at <http://www.scienceadvice.ca>)

Speaker Biography



Keith W. Hipel is *University Professor* of Systems Design Engineering at the University of Waterloo where he is *Coordinator* of the Conflict Analysis Group. He is *Former President* of the Academy of Science within the Royal Society of Canada, *Senior Fellow* of the Centre for International Governance Innovation, *Fellow* of the Balsillie School of International Affairs, and *Past-Chair* of the Board of Governors of Renison University College. Dr. Hipel thoroughly enjoys mentoring students and is a recipient of the *Distinguished Teacher Award*, *Faculty of Engineering Teaching Excellence Award*, and the *Award of Excellence in Graduate Supervision* from the University of Waterloo, as well as the *Outstanding Engineering Educator Award* from IEEE Canada. His major research interests are the development of conflict resolution, multiple criteria decision analysis, time series analysis and other decision-making methodologies for addressing complex interdisciplinary system of systems engineering problems lying at the confluence of society, technology and the environment, with applications in water resources management, hydrology, environmental engineering, energy, and sustainable development. Prof. Hipel is the author or co-author of 5 books, 12 edited books, more than 325 journal papers, as well as many conference and encyclopedia articles (over 14,250 citations; H-index = 55, i10-index = 264). Dr. Hipel is the recipient of the *Officer of the Order of Canada* title; *Japan Society for the Promotion of Science (JSPS) Eminent Scientist Award*; *Joseph G. Wohl Outstanding Career Award* from the IEEE Systems, Man and Cybernetics (SMC) Society; *IEEE SMC Norbert Wiener Award*; three *Honorary Doctorate* degrees (France, Hungary, Canada); *Mirosław Romanowski Medal* and the *Sir John William Dawson Medal* (Royal Society of Canada); *Ven Te Chow Award* from the Environmental and Water Resources Institute, American Society of Civil Engineers; *Jiangsu Friendship Medal*; *Engineering Medal for Research and Development* from Professional Engineers Ontario; and *Foreign Member* designation of the National Academy of Engineering of the United States of America.