

A Sustainable Risk Management Model to Conduct the Energy Transition of Canada

Statistical research consistently states that Canadian energy consumption is expected to increase by 43% between 2007 and 2050¹. Therefore, ensuring the future of Canada's energy supply with a long-term vision will be an inescapable responsibility. Although some of Canada's provinces have changed their energy mix into less-carbon emitting energies, others are just starting the process or reversing what was accomplished under a previous government. For instance, the Alberta Government Climate Leadership Plan (2015) targeted the reduction of carbon emissions by decreasing and replacing energy production from coal-fired generation^{2,3}. As well, the Alberta Government's Phase-out of coal fired generation and emissions (2016) scheduled specific changes over the next decade^{4,5}. Hence, achieving this transition away from coal will be conducted by the adoption of less carbon-emitting sources^{6,7}, strategic environmental risk management of energy corporations⁸, and environmental re-design of public policies and regulatory frameworks⁹⁻¹¹. As a result, a predominant '*Sustainable Renewable Energy Mix*' should emerge in Canada by 2030. Although governments provide the policy framework, it lies with corporations to carry through on the plan. Therefore, the essential purpose of my research is to investigate the role of corporate governance in the transition process into less-carbon emitting fuels through strategic environmental risk management^{12,13} at the board level in corporate energy sectors¹⁴⁻¹⁶. A classical sustainability approach with environmental, economic and social values is now insufficient¹⁷. We have to go beyond the classical 'triple bottom line', adopting '*governance*' as the '*fourth pillar of Sustainability*'¹⁸. Accordingly, a holistic view is required because 'sustainability' implies qualitative improvement and not merely economic growth^{19,20}. Moreover, "*the challenge is to express opportunities and limits in economic terms and institutionalize them in our decision-making*"²¹.

My research will be oriented to answer the following questions: **1)** Which risks have companies identified related to energy transition? **2)** What is the role of risk management at the board of directors level among energy companies in the energy transition? and **3)** Which board of directors characteristics are optimal to ensure governance and to mitigate the categorized risks? Consequently, Alberta's energy sector will be the focus of this research as it is one of the biggest emitters of greenhouse gas (GHG) emissions. The research approach for each of the research questions follows.

- 1) To identify risk related to energy transition, the Management, Discussion, and Analysis of the financial reports/securities commission documents will be search using key words and data analytics software to identify risks related to carbon emissions and energy transition.
- 2) To clarify the role of risk management at the board of directors level in an energy transition, responsibilities of board members and the related committees will be search using proxy statements/management circulars. Key words and data analytics software will be used to determine risk mitigation activities occurring at the board level.
- 3) To investigate if certain board member characteristics are optimal to ensure governance and to mitigate the categorized risks, biographies of board members will be analysed to collect data on characteristics, such as age, expertise (risk management, environmental, energy industry), tenure, gender, independence. Characteristics will be analysed to investigate their role related to risk identification and risk management.

Risk management standards such as ISO 31000:2009 and their guidance documents such as International Professional Practices Framework (IPPF), the Committee of Sponsoring Organizations of the Treadway Commission (COSO), and the Enterprise Risk Management (ERM) will be used to analyze risk management best practices.

Controlling for other variables will offer additional insight. Product mix or segment classification will be considered. Production in the industry can be categorized in a number of different ways. One of them considers two sectors: conventional and unconventional oil and gas. As well, some companies in both sectors have moved to providing energy products rather than simply petroleum and gas products. Yet others categorize companies as upstream (exploration), mid-stream (transportation and storage), downstream (retail), and integrated (combination of previous categories). Some energy companies have invested in emerging and clean energy technologies. Even though all energy industry sectors, regardless of classification, face some similar risks, there are likely different technological, regulatory, sustainability, and energy security risks depending on their specific product lines. For example, the change of Alberta's energy mix into less-carbon emitting fuels implies increased regulatory risk or uncertainty as federal and provincial governments are slow in providing details on policy implementation. This change will provide higher risk for some companies but opportunities for others, depending on their readiness for change. Therefore, the *risk drivers* should necessarily be identified and mitigated as new strategies are being formulated to support optimal corporate governance, based on the company characteristics.

Finally, data analytics will be transformed into numerical values for statistical analysis and, interpretation. They will also provide data for quantitative regression and prediction to properly analyse risk, risk management techniques, and characteristics of governance for various types of product mix or segment classification of energy companies. In sum, appropriate risk management and furtherance of governance at corporate level will enhance energy integrity and energy security with protection of natural capital of Canada.

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