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RISK & INSURANCE CASE COMPETITION

2025

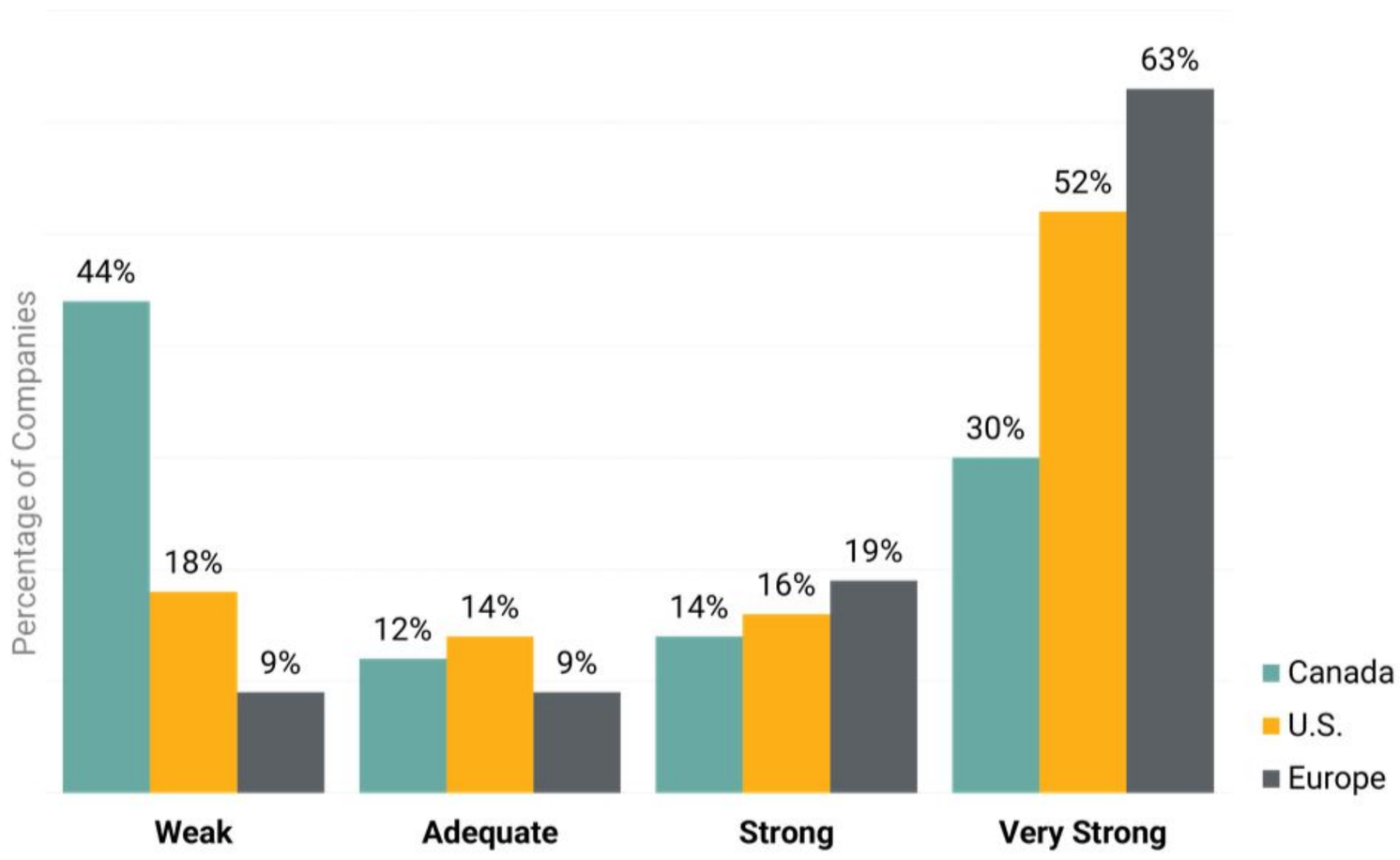
Energy Risk Transfer: Insuring Tomorrow

Case Overview:

Catastrophic (CAT) events have been growing in severity and frequency in recent years, leading to record-breaking loss events and culminating in 2024 having the highest losses in Canada's Property and Casualty (P&C) insurance industry history. A portion of these CAT events can be attributed to climate change, which has resulted in governments and corporations accelerating their transition to renewable energy to reduce their carbon footprints and build a more sustainable future. The Canadian government is also implementing policies to encourage the production and consumption of renewable energy sources.

While Canada has been a leader in the oil and gas sector, it has been lagging behind the US and EU in ESG initiatives. Canadian fossil fuel and mining companies have started to face resistance from investors and are finding it difficult to attract new capital investments because of their slow approach towards adopting sustainable practices[1].

Figure 1. Comparison of Greenhouse Gas Reduction Programs in the Oil and Gas Sectors in Canada, U.S. and Europe



Source: Morningstar Sustainalytics. For information purposes only.

Note: Data analyzed for 43 Canadian, 63 U.S. and 54 European O&G producers' GHG reduction programs.

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1:https://www.theenergymix.com/canada-urged-to-stand-firm-on-sustainable-finance-as-eu-simplifies-u-s-steps-back/

The Canadian government has proposed new regulations aimed at encouraging and incentivizing faster adoptions of emission reduction activities in different industry participants by establishing a “cap-and-trade system”. The proposed limitations on pollution have been structured to be achievable and stimulating for the oil and gas industry[2]. As a result, many energy companies are focusing their efforts to expand into the renewable energy market.

Among these companies, integrated oil and gas firms hold a unique position in the renewable energy transition. With established supply chain connections and vast distribution networks, these companies are well-equipped to drive the integration of renewable energy into existing infrastructure. Recognizing both the opportunity and necessity of adaptation, many have begun expanding into solar, wind, and other clean energy solutions.

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2:https://www.canada.ca/en/environment-climate-change/news/2024/11/canada-releases-draft-regulations-to-cap-pollution-drive-innovation-and-create-jobs-in-the-oil-and-gas-industry.html

With the shift to renewable energy, many new questions and challenges have arisen to confront insurers, in particular insurability. Moving away from the clearly mapped risks of traditional oil and gas operations, insurance models may not efficiently cover the unpredictable nature of renewable energy production, which can be heavily dependent on weather conditions. This has led to the growing adoption of parametric insurance—an innovative insurance solution that activates payouts based on predefined parameters that act as triggers, such as wind speeds or solar irradiance, rather than traditional damage assessments.

Advantages

Parametric insurance offers faster claim settlements and greater financial predictability, making it appealing for renewable energy projects. In the aftermath of rapid and destructive CAT events, traditional insurance can result in delays before policyholders receive funds since payouts are based on assessed total losses. These delays can be critical for insureds facing immediate financial strain. In contrast, parametric insurance provides a predetermined payout triggered by specific event parameters, significantly reducing response time. Additionally, parametric policies can complement traditional insurance by using the triggered payouts to cover immediate expenses or deductibles.

Disadvantages

However, parametric insurance has yet to gain widespread acceptance in the Canadian P&C market, largely due to concerns about its parametric triggers. A key challenge is establishing an industry-wide, standardized metric database for CAT events, akin to the Richter Scale for earthquakes. Additionally, there are concerns for these metrics to achieve the right balance of granularity while maintaining accuracy. Most importantly, parametric insurance requires rigorous testing and analysis to ensure that its triggers appropriately distinguish between insurable pure risk and speculative risk. It is also different to the traditional insurance policy that promises to indemnify the insured.

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Company Overview:

Quant Co. is an integrated oil and gas company founded in Alberta, Canada, in 1954. As an integrated oil and gas company, Quant Co. is involved in the exploration, refinement, and distribution of oil and gas unlike other companies that might specialise in one segment of the process. Decades of business has allowed Quant Co. to develop a vast network in the oil and gas industry with many connections in the supply and distribution line that have been crucial in growing the company's exposure in other markets such as British Columbia, the Prairies, and the Maritimes, which have ultimately made Quant Co. emerge as a top oil and gas company in Canada.

Recent government regulations and pushes have caused the company's partners to seek more environmentally friendly substitutes and alternatives, especially with their shareholder and investor displaying increased ESG expectations.

As a result, Quant Co. has decided to seize this opportunity to further diversify their activities, which not only makes the company a more compelling and attractive option, but also aligns the company for a better and cleaner future.

After thorough research, Quant Co. has decided to focus their efforts on solar and wind farms and locate them in rural areas. This location provides several benefits, with the most obvious being the abundant land available to construct more solar power plants and wind turbines. Rural areas also provide more exposure to higher wind speeds and solar energy given the lack of buildings and high rises. Situating these farms away from urban areas with higher property values and more complex infrastructure could also lower insurance premiums, but factors like limited emergency responses and rebuilding challenges could also increase it.

Quant Co. is considering several provinces to set up their solar and wind farms, for example Alberta and the Maritimes for wind farms, and Ontario and British Columbia for solar farms among others. Collaboration with farmers to include solar power plants and wind turbines on agricultural land has also been a hotly debated topic, with several companies renting space on farmland to start their solar and wind farms, while Ontario officially banned solar farms on agricultural farms in August of 2024[3].

A major challenge Quant Co. anticipates is the risk of CAT events impacting its renewable energy investments. Given 2024's record-breaking losses in the P&C insurance industry, Quant Co. is exploring various insurance solutions. A key option under consideration is parametric insurance that is offered by Stronghold, a company Quant Co. has previously contracted with to insure its traditional oil and gas operations. Stronghold has maintained a portfolio of clients comparable in size to Quant Co. and has respectable and competitive market share of 12% in all provinces across Canada. While Stronghold's existing policies cover exploration, refinement, and distribution, its new contract would extend to insuring renewable energy generation and distribution activities which is a newer area to Stronghold as well.

Some parameters that Stronghold has been researching include wind speed and hail size triggers. Even if turbines are designed to shutdown at high wind speeds, hurricane-force wind speeds of at least 119 km/h could still induce mechanical stress, blade damage, and more, which makes the Saffir-Simpson Hurricane Wind Scale a potential guide for Stronghold. Another example is utilising the CatIQ Hail Scale (CHS). While hail resistant solar panels are able to withstand considerable impact, hail of ~6.5cm in diameter have proven to be damaging to solar panel farms. With the CHS classifying hail sizes up to 11.5cm, they can also potentially serve as useful triggers.

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3:https://news.ontario.ca/en/release/1004981/province-launches-largest-competitive-energy-procurement-in-ontario-history

Assignment:

Due to their lack of experience and uncertainty about Stronghold's quote, Quant Co. has decided to hire an external consulting group to assess the potential losses and exposures of their solar and wind farms. Quant Co. seeks a comprehensive report that:

1. Evaluates the strengths and risks of its existing oil and gas business.
2. Assesses the viability of its expansion into solar and wind energy.
3. Determines how Stronghold's parametric insurance coverage can be advantageous, and refer to the supporting spreadsheet detailing past CAT events when making your decision.

Additionally, Quant Co. remains open to alternative strategies for expansion, including potential international ventures or diversification into other renewable energy sectors. The company's financial standing allows for flexibility in its long-term growth plans over the next 10 to 20 years.

By commissioning this analysis, Quant Co. aims to make an informed decision about its renewable energy transition while ensuring that its risk exposure is effectively managed through innovative insurance solutions.

Instructions:

Please submit your presentation by filling out this submission form before 11:59PM EST, Sunday, May 18th. The form will ask for your team number, team name and your team's presentation in PDF format.

1. Name the submitted file with the format (Team Number_Team Name)
2. If you have any general questions about the case, you could email us at uwquantify@gmail.com or ask in the Discord server, joining here.

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Glossary:

Term - Integrated oil and gas company

Oil and gas operations can be categorised into three sectors:

1. Upstream: includes exploration and production activities.
2. Midstream: includes storage and transportation activities.
3. Downstream: includes refinement and distribution activities.

An integrated oil and gas company combines all three segments and vertically integrates all these activities and operations to allow the company to manage oil and gas productions to market demand.

Term - Pure Risk

Pure risks involves situations where the outcomes are either nothing or a loss. There is no probability that the result of the situation will result in a gain or profit. Pure risk is insurable.

Term - Speculative Risk

Speculative risks have a probability of resulting in a loss or profit. This type of risk could potentially result in a beneficial outcome. Speculative risk is not traditionally insurable.

Term - Prairies

Consists of the provinces of Alberta, Saskatchewan, and Manitoba.

Term - Maritimes

Consists of the provinces of New Brunswick, Nova Scotia, and Prince Edward Island.

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Further Readings:

CAT Events

2024 shatters record for costliest year for severe weather-related losses in Canadian history at $8.5 billion

Lessons of the 2024 NatCat disasters in Canada: Aon

What does 2025 hold for Canada's P&C sector?

Canadian Energy

Oil and Gas Industry Statistics in Canada

Provincial and Territorial Energy Profiles – Canada

About renewable energy in Canada

Canada A safe CHOICE for bold BUSINESSES

In the global shift to renewable energy, Canada risks being left behind

Parametric Insurance

Descartes launches “next generation” parametric tornado coverage for solar farms

Vortex offers relief through parametric coverage after hurricanes Helene and Milton

IBISA and VisionFund launch suite of parametric climate insurance products

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