Seeing Beyond Risk

Canadian Institute of Actuaries / Institut canadien des actuaires

Voir au-delà du risque

March 27, 2015

Ministry of the Environment and Climate Change
11th Floor, Ferguson Block
77 Wellesley Street West
Toronto, Ontario M7A 2T5

Dear Sir/Madam:

This submission to the Ontario Government's Ministry of the Environment and Climate Change (MECC) is from the Canadian Institute of Actuaries (CIA).

About the CIA

Actuaries are business professionals who are skilled in the application of mathematics to financial problems that entail uncertainty over a long-term horizon. They employ their specialized knowledge of the mathematics of finance, statistics, and risk theory on problems faced by:

- Insurance companies (both life and property/casualty);
- Pension and health plans;
- Government regulators;
- Social programs; and
- Individuals.

The CIA, as part of a joint effort with other North American actuarial associations, is working on the development of the Actuaries Climate Index[1] (ACI), which will make fact-based information about emerging changes in climate outcomes available to governments and citizens. We would be pleased to speak with MECC staff to provide more information about our ACI and related plans.

The Discussion Paper[2] and our Focus

Through this consultation process, we understand that the MECC is seeking input to inform the development of a comprehensive strategy that will help Ontarians adapt to climate change and meet the following mitigation goals:

[1] See the November 2012 Phase I report: Determining the Impact of Climate Change on Insurance Risk and the Global Community – Key Climate Indicators. http://www.cia-ica.ca/docs/default-source/2012/212091e.pdf.

[2] http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2015/012-3452.pdf.

1740-360 Albert, Ottawa, ON K1R 7X7 613-236-8196 613-233-4552
head.office@cia-ica.ca / siege.social@cia-ica.ca **cia-ica.ca**

- Reduce emissions by 15 percent below 1990 levels by 2020;
- Reduce emissions by 80 percent by 2050; and
- Work towards carbon neutrality by the end of the century.

The discussion paper highlights five key areas: traditional knowledge, actions in key sectors, a price on carbon, communities and built form, and science and technology.

We have chosen to comment on two topics:

1. A price on carbon; and
2. Risk assessment in the design and rehabilitation of infrastructure.

1. A Price on Carbon

We believe that the following features are important in any approach that may be adopted:

- *Effectiveness* – the carbon pricing approach taken must be designed and implemented in a manner that will allow us to effectively reach Ontario's emissions reduction targets;
- *Fairness* – the price must be designed in a way that is fair, especially to low-income people and workers, and takes into account regional realities, such as those of rural populations;
- *Simplicity* – the price should be clear, easily implemented, and simple to run;
- *Predictability* – the price must be predictable over a multi-year time horizon, and be geared toward continuous improvement and increasing stringency over time; and
- *Transparency* – it must be clearly monitored, and reports must be issued on how progress is being made towards emission reduction targets, how the carbon price is raising revenue, and how that revenue is being used.

2. Risk Assessment in the Design and Rehabilitation of Infrastructure

As quoted in page 4 of the discussion paper, the Insurance Bureau of Canada (IBC) noted in its 2014 Facts of the P&C Insurance Industry that payouts for insured losses "from extreme weather have more than doubled every five to 10 years since the 1980s". Realizing this, as well as the fact that traditional methodologies and data that actuaries relied on to price water damage insurance coverage now need to be supplemented with additional data and analyses, the CIA published a research paper, Water Damage Risk and Canadian Property Insurance Pricing[3].

It identified drivers that are challenging actuaries' ability to manage water damage risks. It also established six practices that would enhance actuaries' understanding of such risks; one, the availability of data about the local environment, would aid Ontario communities in determining their local vulnerabilities and risks.

[3] http://www.cia-ica.ca/docs/default-source/2014/214020e.pdf.

The water damage paper states:

> Valuable data about the local environment would include data about infrastructure supporting the insured property such as the age, diameter, and construction material of pipes leading to a property. Collaboration of the P&C *[property and casualty]* insurance industry with government could facilitate the collection of external data and thus be an important initiative to enhance good practice related to data.
>
> The CCAP *[Climate Change Adaptation Project (Canada)]*[4] discusses the need for governments at all levels to support the development of better data:
>
> > Governments can serve Canadians by working with insurance companies to ensure appropriate information is available to better anticipate the risk of severe weather damage to homes and businesses. Without this information, insurers face information asymmetries when trying to accurately price the risk associated with climate change. This includes detailed, local data about historic severe weather events, including intense rainfall, severe wind (including hurricanes and tornadoes), winter storms, flooding, and wildland fires. Anticipating the risk of damage also requires reliable data regarding the state of public infrastructure and socio-economic information. Environment Canada, Natural Resources Canada, Infrastructure Canada, Statistic Canada and others have the potential to improve the information available.[5]
>
> Other valuable data about the local environment would include (but not be limited to) weather and topological data . . .

Actuaries do not have access to much of the data described above. If such data became available, there may be opportunities for actuaries to partner with Ontario communities to better understand local vulnerabilities and risks.

An example of the type of partnership that may be possible is the Municipal Risk Assessment Tool (MRAT), led by the IBC in partnership with municipalities across Canada. In a quote from the research paper, the IBC notes that the MRAT is a web-based tool that:

> . . . will allow municipalities, and potentially insurers, to assess the impact of severe weather on urban drainage systems by displaying risk zones to indicate relative degree of risk. MRAT incorporates data related to the current state of infrastructure, claims history, and climate change, as well as future projections, to "predict and display with a high degree of accuracy the probability that infrastructure failure will occur within a quarter of a city block".[6]
>
> MRAT combines data on the current condition of infrastructure and how it may be affected by future climatic events to produce risk maps that identify where potential municipal infrastructure vulnerabilities may exist.

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[4] Feltmate, Dr. Blair, and Dr. Jason Thistlewaite. Climate Change Adaptation: A Priorities Plan for Canada. Climate Change Adaptation Project, May 2013: vi. http://bit.ly/19TZMEc.

[5] Ibid.: 25.

[6] Insurance Bureau of Canada. Municipal Risk Assessment Tool. Accessed on August 15, 2013. http://www.ibc.ca/nb/disaster/water/municipal-risk-assessment-tool

The CIA recommends that Ontario take a leadership role in bringing together the various stakeholders to focus on developing the necessary statistical data and projection techniques to enable better estimation of future costs. This is familiar territory to actuaries. The Institute would hope to be a strong contributor to any steering committee for this undertaking.

We appreciate the opportunity to provide input on Ontario's Climate Change Strategy and would welcome the prospect of discussing any topics addressed in this letter.

Yours truly,

Jacques Tremblay, FCIA
CIA President