



SOCIETY OF ACTUARIES

Article from:

Independent Consultant

November 2008 – Issue 22

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December EA Section
Webcast:*Starting Your Practice; Ready for Success*

Dec. 9, 12:00 - 1:00 EST

Join this webcast with featured writer David Rintoul for practical guidance in setting up a consulting practice, giving you the legal and business tools to succeed. The session will cover such issues as:

- The form of business entity to use,
- Preparing before you leave your current employer,
- If your non-compete is enforceable,

Actuaries and the Environment in Australia*by Jill Green*

Over the last 10 years or so several actuaries in Australia have become involved in activities relating to the environment. In some cases, this has involved paid employment, but mostly we have participated in public policy development, education and research. This article provides an overview of our activities, and hopefully some ideas for actuaries in the United States and Canada.

How Does the Environment Relate to the Work of Actuaries?

The major focus of attention is currently climate change. This issue provides an excellent example of the broad range of areas where actuaries may contribute to the development of solutions. It is widely accepted now that dealing with the economic impact of climate change itself, and the impact of our policy responses, is a risk management issue for the whole planet.

The anticipated impacts of climate change include increases in storm damage, bushfires, flood and coastal inundation, as well as associated risks to human life and health. The related financial losses are obvious areas for actuaries' attention on the liabilities side of the balance sheet.

At the same time, the economic measures taken by governments in an attempt to mitigate the effects of climate change will have effects on the values of assets across the whole economy—perhaps nowhere more than in Australia, with its heavy reliance on fossil fuels and its high per capita emissions.

All these costs will need to be borne in addition to the potential direct losses of agricultural and other productivity associated with rising average temperatures, rainfall changes, storm risks and sea level changes.

If we have any interest in controlling the solvency, profitability or value of our major financial institutions, then we need to start assessing the scale of these impacts now. It is clear that they will materially affect the aggregate demand for capital in the near and medium term, change the nature of many Australian businesses and materially modify the risks attaching to their equity and debt. No reliable understanding of the economy is possible without an understanding of the issues of climate change.

Fortunately, many elements of the actuarial skill-set can be applied to other environmental issues. The parameters are familiar—for example, there is usually a need for a long-term focus and uncertain data. Often the development of

- Assembling a "virtual firm,"
- Structuring your deal with partners,
- Managing intellectual property,
- Independent contractors vs. employees, and
- Taking a minority interest in a business.

Find more information [here](#) on the SOA Website.

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solutions involves the understanding of the operation of market instruments. Management of risk is a major factor, particularly with issues like the potential impacts of loss of productivity, but also in areas like biodiversity and natural resilience. The principles of the actuarial control cycle have direct application to many of these situations.

Our Involvement So Far in Environmental Issues

a) General Insurance Industry

Members of the Institute of Actuaries of Australia (IAA) working in the general insurance industry have been actively involved in researching the potential impacts of climate change on insurance costs, particularly in areas of storm and flood damage. Models have been developed that are able to quantify the cost and risk profile of the significant increases in damages that could occur. This work is often sponsored by, and carried out jointly with, Australian consultancies and/or insurance companies.

The results of this research have been published widely in industry journals and presented at seminars conducted by the IAA and other organizations. Recommendations have been made on how to provide more comprehensive flood insurance, including flood maps for Australia, public education and legislative facilitation.

One insurer, IAG, has combined with a group of other companies to establish the [Australian Business Roundtable on Climate Change](#). In 2006 this group commissioned research that highlighted the benefits of early action on climate change. IAG also is a sponsor of the Australian Climate Group in association with the WWF Australia, a group of commercial and scientific experts that aims to promote effective public policy on climate change.

b) Public Policy Submissions

The Institute has made several submissions in response to reports and policy proposals that have been published by the Australian government. The recent submissions concerning the proposed Australian emissions trading scheme (ETS) were designed to give an objective view of the merits of the ETS design proposals. The Institute's objective approach was seen to be particularly valuable because of the tendency of the public debate to be heavily influenced by commercial and political interests. These are available on the Public Affairs section of the [Institute's Web site](#), together with earlier submissions and papers.

c) The Energy and Environment Committee

The Energy and Environment Committee of the Institute of Actuaries of Australia had its beginnings back in 1998. Members of the Institute with a concern about environmental issues have volunteered to join the Committee. A wide variety of activities have been undertaken, over the past 10 years. These have included writing articles for Actuary Australia magazine, presenting papers at the biennial conventions, drafting submissions to government inquiries and working with university students, government departments and the Australian Commonwealth Scientific and Research Organization (CSIRO).

We have from time to time reviewed our purpose and role within the Institute, but the basic objectives remain:

- i) to develop, promote and assist the education of members in the energy and

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environment field, and
 ii) to undertake and assist in research projects and public debate regarding energy and environment issues, contributing a sound actuarial basis to the field.

The areas studied by the Committee can be divided in a few themes:

1. Valuation of forests and biodiversity

Immediately following the negotiation of the Kyoto Protocol in 1997, the Federal Government's Australian Greenhouse Office released a series of discussion papers on the practical operation of emission trading. In 1999, the Committee drafted a submission to the Greenhouse Office discussing issues and solutions in relation to the risk management of forests acting as carbon sinks under the Protocol.

A group assisted an actuarial student doing a masters degree paper on the potential pharmaceutical value of biodiversity in a national park region using modified CAPM methodology.

2. Sustainability

The Committee has been monitoring the development of the socially responsible investment (SRI) market, now generally known as "Responsible" or "ESG" (Environmental, Social, Governance) investments. A group contributed to work on the analysis of the performance of socially responsible investments presented to an industry conference.

A paper was written for the 2003 Convention on corporate reporting of sustainability performance including case studies of actions being taken in the insurance and electricity industries.

3. Modelling techniques

We have reviewed what would generally be described as futurist modelling techniques. We put this work into practice by undertaking a Delphi study of the membership's views of the future outcomes for a diverse range of social, economic and environmental topics. The results were described in a paper at the 2005 convention.

4. Climate change and energy issues

This area has become the major part of our work, much of it described above. We have had members working in the energy field who have written papers on topics as diverse as weather derivatives and how Australia can reduce emissions by 60 percent by 2050.

Future Prospects for Work for Actuaries in Environmental Fields

Apart from work with general insurers that has been referred to above, there are currently some actuaries whose work has a direct connection with the environment. Sometimes this is voluntary work assisting NGOs with advocacy work. Offers of pro bono work are usually welcomed enthusiastically. Others have previously worked with energy companies or universities, and this work has provided direct experience that could be applied to the opportunities that are now arising from the need for companies to respond to carbon emission constraints. Some actuaries are currently working with investment managers that apply selection policies that include specific environmental considerations.

It has to be said that only a small number of actuaries in Australia are currently working directly in areas with an environmental aspect. The actuarial profession in Australia has yet to develop a strong profile in the relevant work areas. While actuarial skills and the control cycle concept are suitable for a variety of environmental applications, as a profession we are competing with a lot of others in this space. Other professions, such as accountants, have benefited from their direct links with other corporate management work. However the opportunities are out there for "entrepreneurial" actuaries who can see a way to develop the necessary skills and experience.



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