

Stormy weather threatens finan

Louis Perroy discusses the phenomenon of climate change and its effect on actuaries.

MAY I ASSUME THAT THERE IS NO DOUBT IN THE minds of readers that global warming, or climate change, is a proven fact. After all, this was first suggested two centuries ago, in 1827 by JB Fourier and independently in 1860 by J Tyndall of the Royal Institution. For those who still need convincing, I would refer them to the website of the Intergovernmental Panel on Climate Change (IPCC) (www.ipcc.ch), and also suggest reflection on the extreme summer droughts, the number of floods around Europe, and the storms in North America or Asia of the past three years.

Economic effects of global warming

Studies carried out by the IPCC predict that global warming is likely to have severe consequences for individuals, communities, and economies. The effects of global warming will be felt to a differing extent in different parts of the world. Tropical countries will suffer greater consequences than temperate countries. The IPCC states that the impact of climate change will 'exacerbate inequities in health status and access to adequate food, clean water, and other resources'. For instance, 1.7bn people currently live in 'water-stressed' countries. This is projected to increase to 5bn by 2025. Ironically, it is mostly the rich temperate countries which have been the source of greenhouse gas (GHG) accumulation in the atmosphere during the past 100 years or more.

The economic consequences will also be sector-specific (see the box to the right). Some sectors (like power generation) are guilty of emitting highly detrimental greenhouse gases and are likely to face regulatory pressure to change their way of operation, while others (like agriculture) suffer the worst consequences of global warming. Climate change represents a major risk to health, biodiversity, food supply, and trade.

Although it is taking longer than expected to be ratified, the Kyoto protocol still represents the best way forward initially (reduction period 2008 to 2012). Either the United States or Russia has to ratify the protocol for it to be enforceable. However, countries such as the UK, Holland, and Denmark now have the necessary regulations in place. These countries will be followed by the other members of the European Union (EU) in 2005. The EU directive scheme will follow the Kyoto protocol structure, in particular in establishing the 'Emission Trading Scheme' (ETS) which allows carbon credits to be traded among the various participants to meet their obligations.

Global warming and financial services

The financial services sector is at the heart of the economy. It provides all sectors of the economy with blood and oxygen through its lending capacity, investment, and coverage of risks for individuals, businesses, and properties.

So far, the consequences of climate change on the

financial services sector have been minimal – even less so in financial markets. Nonetheless, the effects of climate change have already started to be felt by reinsurance companies and some non-life insurance companies. As part of a general increase in the number and scale of catastrophes, Munich Re has reported total insured losses in 2003 which are almost a third higher than 2002 losses. Most of this increase has resulted from storms in the US, heat waves in Europe, and forest fires in the US, Canada, Europe, and Australia.

However, two current developments may finally start to impinge on the financial world.

■ **Climate change is a fact** Climate change and its likely effects are now considered scientific fact, not just hypothesis. Models have been built to analyse its impact and these models are constantly being developed and updated as techniques become more sophisticated. This means that those sectors with potential physical risks, mentioned in the box to the right, will inevitably become more involved in climate change consequences.

■ **Legislation** Legislation is gradually being put in place around the world, despite the slow ratification of Kyoto. The EU will have its first period of implementation between 2005 and 2008.

The Kyoto protocol's mechanisms will be authorised within the EU emissions trading scheme. The joint implementation (JI) mechanism will give EU countries access to carbon-friendly inter-companies projects in other Annex 1 countries (roughly equivalent to OECD countries). The clean development mechanism (CDM) will open similar access for emission efficient projects, as provided by the JI mechanism, to countries in the rest of the world.

Despite the US government's refusal to ratify Kyoto, we are starting to see some progress in the US. Three states (California, New Hampshire, and Massachusetts) are implementing emission reduction legislation and numerous other states are putting in place milder measures. Likewise in Australia, New South Wales is developing climate change action, although the national Australian government has rejected the ratification of Kyoto.

Financial institutions are usually reluctant to anticipate policies. They do not necessarily take into account the likely consequences of international agreements and often react to new legislation only after it has come into force. Their reluctance can be partly explained by the numerous political changes that often happen before new legislation is implemented fully.

Moreover, as mentioned above, the worst consequences of global warming may be occurring in poor countries where financial institutions and stockmarkets have relatively limited exposure. This may help to explain the unwillingness of financial institutions to take climate change measures into account, despite the fact that anticipation could clearly give them a competitive advantage.

Sectors with potential regulatory pressure

- Fossil fuel power generation
- Oil and gas extraction and refinery
- Manufacturing requiring an important amount of energy (aluminium...)
- Chemical
- Cement, ceramic, and glass
- Paper pulp
- Transportation (aviation, automobile...)
- Agriculture
- Forestry (because of damaging deforestation of natural forests).

Sectors with potential physical risks

- Agriculture
- Forestry
- Fisheries
- Healthcare
- Insurance and reinsurance
- Tourism
- Real estate

cial services

Inevitably, the financial services sector will have to adapt to the changes in the economy caused by climate change. Even if an immense international mitigation effort to stabilise greenhouse gases occurred in the near future, climate change would still carry on due to the ongoing effects of those gases which have already accumulated in the atmosphere.

Some examples of initiatives by the industry to address environmental and social global issues do exist:

■ The Carbon Disclosure Project (www.cdproject.net) is a worldwide project of the Rockefeller Philanthropy Advisers, initiated in 2000 at 10 Downing Street. It is in the form of a report drawn from questionnaires sent to the FTSE500 largest companies in the world. The last report (2004) followed an information request signed by 95 institutional investors with assets of \$10 trillion.

■ The Institutional Investors Group on Climate Change (www.iigcc.org) is a collaboration of 14 European fund managers and pension funds to address the fiduciary issues posed by climate change.

■ The Investor Network on Climate Risk (www.incr.com) was launched in late 2003 at the Institutional Investor Summit on Climate Risk at the United Nations in New York. It was initiated by ten world investment leaders to promote better understanding of the risks of climate change among institutional investors.

■ In the middle of 2003, 20 of the largest international banks, representing nearly 80% of the world private project finance in 2002–03 (according to Dealogic Projectware), signed up to the Equator Principles for Sustainable Development. This is an agreement to use clear, responsible, and consistent rules for environmental and social risk management in project finance lending.

The progress of the socially responsible investment (SRI) market is also an indication that market forces can favour investing ethically and environmentally. In the US, \$1 out of every \$8 invested is SRI. Having said this, the criterion used by SRI funds seem too loosely defined to always have a beneficial impact.

If a similar initiative to the Equator Principles were to be extended to global warming and applied by the rest of the financial services industry, this could represent a substantial force in mitigating climate change, bearing in mind the influence of the financial services sector as a whole on businesses and individuals.

Roles for actuaries

The majority of actuaries work within the financial services sector, where they are 'making financial sense of the future', concerned with medium- to long-term financial problems. Climate change will have a definite effect on the work of actuaries. Their work in insurance companies, pension funds, or the banking and investment sectors gives them a crucial role in the central dilemma of whether to pursue adaptation to climate change or mitigation.

As discussed in a previous article in *The Actuary* (June

2003), non-life insurance actuaries will have to learn to reduce their exposure to climate change through policies of 'exclude risks, mitigate risks (eg building flood defences), transfer risks, or adjust product price'. Actuaries who look at asset and liability management may have to monitor increasingly the consequences of climate change on their medium- to long-term scenarios. For the projection of assets, a distinction by sectors of assets may be necessary to reflect the likely consequences of climate change.

The macroeconomic consequences of climate change may also have to be taken into consideration, bearing in mind the disruption to the global economy which climate change is likely to cause. Long-term business actuarial regulatory obligations for life insurance and pension actuaries should probably include consideration of climate change.

Finally, actuaries working on the investment side, as detailed above, will have to allow for climate change on the various sectors of the economy and the global economy in their investment strategies and the financial models they use.

All these considerations mean actuaries will have to be informed about the latest climate change projections from climatologists and other scientists, and about climate models predictions and new legislation on climate change in the UK, EU and the rest of the world.

Climate change will require an extra degree of vigilance from actuaries in their work but, at the same time, will open a whole new range of opportunities. These opportunities may include:

- ◆ new types of insurance, such as insuring the carbon liabilities of businesses;
- ◆ wider use of new instruments such as weather derivatives, alternative risk transfer (catastrophe bonds);
- ◆ potential wider role in business interruption insurance; and
- ◆ the new emission trading scheme market, which may eventually extend globally.

At present it appears there is little awareness among actuaries about the disruption climate change may bring to our activities. Pensions actuaries were directly criticised at the IIGCC conference in early 2004 for falling behind in taking climate change factors into consideration and were even seen by some people as hindering progress in this area.

I hope this article will prompt a reaction from members who think that their work could be affected by climate change. I hope also that we can change the current perception that our conservative approach as actuaries prevents us from including in our work new and important phenomena such as climate change and global warming. □



Since June, heavy monsoon rains and overflowing rivers have engulfed two-thirds of Bangladesh

Associated Press



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