



Association of British Insurers

# A Changing Climate for Insurance

A Summary Report for  
Chief Executives and  
Policymakers



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Dr Dlugolecki was the chief author of the Insurance and Financial Services Chapter in the Second Assessment Report of the Intergovernmental Panel on Climate Change (1995) and edited that chapter in the Third Assessment Report (2001). He also contributed to UK Government reviews (1991, 1996) and chaired two research reports on climate change for the Chartered Insurance Institute (1994, 2001).

Dr Dlugolecki now writes and consults privately on financial services strategy and climate change. A focus of his recent work is the importance of engaging the asset management function in understanding and reducing the risks rising from climate change. Among the bodies he advises are the Tyndall Centre for Climate Change Research, the Carbon Disclosure Project, and the UNEP Finance Initiative.

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## CONTENTS

	<b>Foreword</b>	3
<b>1</b>	<b>Key Messages</b>	4
<b>2</b>	<b>Introduction</b>	6
<b>3</b>	<b>Risk Transfer (Underwriting) and Risk Management</b>	8
	(i) <b>Property Insurance</b>	8
	(ii) <b>Other General Insurance Products</b>	11
	(iii) <b>Health Insurance</b>	12
	(iv) <b>Life and Pensions</b>	13
	(v) <b>New Products</b>	14
<b>4</b>	<b>Investments</b>	15
	(i) <b>Equities</b>	15
	(ii) <b>Property Investment</b>	16
	(iii) <b>Securities and Bonds</b>	17
	(iv) <b>General Insurers' Investment Portfolios</b>	17
<b>5</b>	<b>In-house Operations</b>	18
<b>6</b>	<b>Communications and Reputational Issues</b>	19

## Foreword

Climate change is no longer a marginal issue. We live with its effects every day. And we should prepare ourselves for its full impacts in the years ahead. It is time to bring planning for climate change into the mainstream of business life.

Some people may question whether we really need yet another report on this very high profile topic.

The media, of course, has carried many articles and debates about the science behind global warming. These have helped to inform policy discussions and to educate the general public.

The Government has published a number of extremely useful reports as more information becomes available about the implications of changes in the climate for public policy. This developing analysis - much of it very recent - provides a baseline for future work, and has convinced the Government to make climate change a priority during its presidencies of the G8 and the European Union during 2005.

And Hollywood has recently produced a blockbuster movie which, while clearly fictional, will raise the profile of the topic still further.

So there is already a great deal of public and political concern about this issue.

But few business sectors have yet attempted to analyse in a rigorous way the practical implications of climate change for their industry and their customers. This is what this ABI report - A Changing Climate for Insurance - is designed to do. The ABI commissioned Dr Andrew Dlugolecki, an internationally respected authority on climate change and insurance, to undertake this timely study.

Insurance is in the front line of climate change. As the widespread floods of autumn 2000 demonstrated so clearly, it is insurance companies that will have the responsibility of dealing with many of its consequences. And it is insurers who must be equipped to analyse the new risks that flow from climate change, and to help customers to manage these risks.

Much of the industry's work over the next few years will concentrate on the implications of climate change for homeowners and businesses. Erratic and extreme weather will require changes in underwriting practices and claims handling by property insurers. But it is important to consider the industry's other responsibilities as well, ranging from health insurance to our role as investors and shareholders.

This presents the industry with a considerable agenda, which the ABI will now be taking forward with member companies and Government. We will continue to work in partnership with the public sector - the ABI's Statement of Principles on the provision of flood cover is a classic example of how the private and public sectors can work together for the benefit of customers. And we will also continue to press Government and other authorities to take steps to counter or prepare for the impact of climate change where this is necessary and cost-effective.

We do not pretend to have all the answers - even for our own industry. We are still at an early stage in our understanding and analysis of the opportunities and challenges presented by climate change. But work done today will repay the effort many times over in the decades to come.

**John Parker**  
Head of General Insurance  
Association of British Insurers  
June 2004

## KEY MESSAGES

Climate change is not a remote issue for future generations to deal with. It is, in various forms, here already, impacting on insurers' businesses now. As experts in managing risk and its financial and economic consequences, the insurance industry is uniquely placed to contribute to the climate change debate. Insurers understand risk and understand their customers. Insurance as a business also needs to manage its own risks arising from climate change, and to engage with Government and others who affect those risks.

Climate change currently affects the insurance industry in a number of ways. The main ones are:

- **Changing customer needs, requiring new underwriting skills as customers seek to limit new liabilities arising from climate change regulation, or exploit new assets;**
- **Changing patterns of claims, principally on the household, property and business interruption accounts;**
- **New and tightening regulation, driving business costs and, increasingly, impacting on the investment environment;**
- **As a source of reputational risk, requiring the industry to communicate effectively with customers, Government and other stakeholders, so that they understand the financial consequences of climate change, the options for managing these and the response of the industry to these challenges.**

This report has been produced for the Association of British Insurers (ABI) to examine the implications of climate change for the industry, its customers and the public policy process, and to identify the next steps in understanding and managing the risks and opportunities it presents. It focuses on practical measures the industry can address, together with partners in Government and elsewhere, in order to minimise the costs and realise the opportunities that climate change presents.

The key findings of a changing climate for insurance are:

### Changing Customer Needs

- **Insurance provides important risk transfer mechanisms enabling business and society to manage potential liabilities in the most economically efficient way. These mechanisms will become increasingly valuable as climate risk increases.**
- **Alternative risk transfer markets are expanding, particularly in the USA, as customers seek cost effective ways to deal with their increasing weather exposures.**
- **New technologies emerging in response to climate change pressures, such as renewable energy assets, will require insurance.**
- **Climate change may present new liabilities requiring insurance. For example, directors may be held responsible for the environmental impact of their businesses in future, requiring wider Directors & Officers cover.**

### Changing Patterns of Claims

- **Weather risks are already increasing by 2 - 4 % per year on the household and property accounts due to changing weather. Claims for storm and flood damages in the UK have doubled to over £6 billion over the period 1998 - 2003, compared to the previous five years, with the prospect of a further tripling by 2050.**
- **Other general insurance lines, such as motor insurance, have seen some increase in weather-related claims over the same period, but at a much lower rate of growth. These changes may accelerate and affect a wider range of products, particularly liability classes, in future.**
- **Indirect impacts of climate change on health and longevity could potentially influence the balance between state and private provision of health care and pension products, but the effects are likely to be small in relation to other policy pressures.**
- **Some of these changes can be reduced through effective action by the insurance industry in partnership with Government. Insurers can provide market signals to encourage or incentivise customers to avoid or avert risks, whilst Government can ensure that society both addresses the underlying issues (such as greenhouse gas emissions) and improves the country's ability to deal with climate change.**
- **Where risks are not managed in this way, insurance costs are likely to rise in future.**

### **New and Tightening Regulation**

- Emissions trading regulation and minimum construction standards are already in place, with further measures likely if the Government's aspiration for a 60 % reduction of greenhouse gas emissions by 2050 is to be achieved.
- These regulations impact on immediate claims costs, for example by requiring higher thermal efficiency in replacement windows, but may reduce future costs by limiting or slowing the pace of climate change.
- Investment returns will increasingly be affected by the ability of particular sectors or companies to adjust to emissions standards. This will potentially affect all investment funds, not just Socially Responsible Investment funds.
- The insurance industry needs to engage with Government to ensure future regulation takes account of the needs of customers and the impact on insurers' businesses.

### **Communications and Reputational Risk**

- Climate change is often threatening and difficult to cope with and insurers are often the messengers of change through the pricing and conditions attached to their policies. The industry can easily become associated with unwelcome messages so it will be important to communicate very effectively with all stakeholders.
- Given its key role in the economy, the insurance industry is seen by customers, Government and other commentators as an important contributor to tackling climate change.
- Customers, in particular, look to the industry to help them deal with their exposure to the increasing risks climate change presents, and to speak up in the public debate on how the UK should avert or manage these risks.
- Many insurers have already incorporated environmental measures into their Corporate Social Responsibility policies, often achieving cost reductions or other benefits in the process. It is important that the industry continues to communicate the extent of these contributions to tackling climate change.

### **Moving Forward**

The report identifies a number of issues for individual insurers, the ABI, and Government and other stakeholders to take forward, and suggests some practical courses of action. The ABI will work with member companies over the next few months in order to shape policy going forward. This approach should enable the ABI to meet its aim to promote a business and regulatory environment within which insurers can continue to meet customers' changing needs by operating profitably and through managing business risks. And it is consistent with the vision for the future, articulated by Sir David King, Chief Scientific Adviser to the Government, at the launch of the Government's Foresight Report on Future Flooding, of a low emissions: high growth economy.

Dr Andrew Dlugolecki

June 2004

2

INTRODUCTION

Climate change is often discussed as a far off event of uncertain nature. Even where scientists are agreed that change will happen, and in what direction, the precise timing and scale are not known, or assessments have such wide variability that businesses and their customers are left wondering what, if anything, they should do. Yet the UK's climate has already changed from our experience in the 1960s, and will continue to change with increasing intensity. Shifting weather patterns already affect insurers' customers and therefore the business of insurance. Claims experience, regulation, investment returns, operating costs, and communications and reputational issues will all require further reflection and action. Insurers have an intimate understanding of the risks that business and private individuals face in their daily lives, and are essential partners with Government and other public authorities in helping to ensure that risks remain manageable, and thus insurable. The pricing and availability of insurance, and the terms and conditions that are associated with it, can be important incentives to sensible risk management or avoidance. Insurance will thus have a vital part to play as our understanding of climate change and its impacts develops.

This report identifies some of the key impacts that climate change is likely to have on all aspects of the insurance industry - risk transfer, investment, business operations, and communications and reputational issues. It examines a range of responses that the industry might make to ensure that it keeps abreast of climate change, and scores these against key decision criteria. Finally, it sets out possible future actions for individual insurance businesses, for the Association of British Insurers (ABI), which represents these businesses collectively, and for the industry's partners in Government and other key industries. These will be discussed over the next few months in order to determine our future approaches.

Climate Change and Weather Patterns

There is now international scientific consensus<sup>1</sup> that, as a result of increasing concentrations of carbon dioxide in the atmosphere from burning of fossil fuels, the Earth's climate is changing and will continue to change over this century and beyond. Carbon dioxide levels have already reached their highest for almost half a million years and are rising faster than ever before. The 1990s were the warmest decade globally since records began, and 1998, 2002, and 2003 were the three warmest years.

<sup>1</sup> Climate Change 2001: IPCC synthesis report, Intergovernmental Panel on Climate Change, 2001  
<sup>2</sup> Annual review of natural catastrophes 2003, Munich Re Topics, 2004  
<sup>3</sup> Climate change observations and predictions: recent research, Hadley Centre, Met Office, December 2003  
<sup>4</sup> Climate Change Scenarios for the United Kingdom, UK Climate Impacts Programme, April 2002

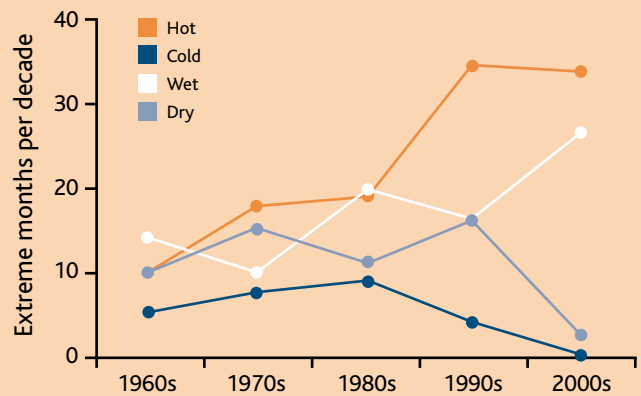
Changes to date

Weather in the 1960s was close to the long run average, but since then we have experienced many warmer and wetter than expected months, especially in the 1990s and 2000s, and fewer cold months (Figure 1).

At the same time there has been a rise in the number of severe weather events globally<sup>2</sup>. The number of winter storms crossing the UK has doubled over the last 50 years<sup>3</sup>.

Figure 1

The number of extreme temperature and rainfall months per decade in the recent UK record. Extremes are defined as values in the top or bottom 10 % of the historic distributions. We would expect 12 extreme months per decade if the climate was not changing.



Expected future changes

These climate trends are likely to continue. Summers will become hotter and drier, while winters will be milder and wetter. Climate change scenarios published by the UK Climate Impacts Programme<sup>4</sup> show that by the end of the century:

- Average annual temperatures across the country could increase by between 2 and 3.5 °C by the end of the century. Two out of every three summers could be as hot as the very hot summer of 1995.
- Winters are likely to become wetter with heavy winter precipitation (principally rain, but some snow) more frequent. Intense but infrequent (one day in two years) rainfall events may be 5 - 20% heavier by the 2080s.
- Summers may become drier everywhere, but particularly in SE England. Summer soil moisture may be reduced by 40% across large parts of England by the 2080s.



- **Normal sea levels will continue to rise around most of the UK's shoreline, particularly SE England where the rise could be between 26 and 86 cm above the current level. Extreme sea levels will be experienced more frequently, particularly on the east coast, occurring between 10 and 30 times current frequency.**
- **Likely changes to wind speeds have the greatest degree of uncertainty of all weather phenomena. Average wind speeds are not expected to vary greatly from those of today in Scotland and NW England, but regional differences may diminish, with higher average wind speeds, by about 6 %, on the south coast.**
- **Storminess is expected to rise, with up to 50 % more winter depressions crossing the UK, but with summer depressions falling by 20 % to four times per year on average.**

It is generally assumed that these changes will take effect gradually, with society, and insurers, being able to adapt over time. However, there has been abrupt change to a radical new climate state at least eight times in the past - particularly during periods of climate instability, such as those we face currently (Box 1). This means insurers, their customers and the Government need to be thinking through the implications of sudden, as well as more gradual, change.

### Box 1. Risks from extreme climate change

One of the key triggers for historic abrupt changes in climate appears to be failure of the Gulf Stream. This results in major changes in ice-cover or vegetation, dramatic shifts in the ocean circulations, and a sharp drop in temperature for the North Atlantic and neighbouring land masses.

Although this scenario is considered unlikely, at least during this century, the implications would be huge.

More likely, climate change could accelerate due to natural feedback mechanisms, such as the disappearance of tropical rainforests, the thawing of the tundra, and the shrinking of ice-cover, all of which would speed up global warming. In addition, impacts in developing countries may spill over through economic disruption and large-scale migration from parts of the world worst hit.

A recent Pentagon report suggested that if abrupt climate change occurs, "disruption and conflict will be endemic features of life" and that "many countries' needs will exceed their carrying capacity" with possible nuclear proliferation and large population movements.

Source: Randall and Schwartz Report, Office of Net Assessment, Washington DC, 2003

<sup>5,6</sup> The UK Climate Change Programme, Department of Environment, Transport and the Regions, November 2000

<sup>7</sup> Our energy future - creating a low carbon economy, Department of Trade and Industry, February 2003

### Action to Counter Climate Change

The Earth is already locked into a certain degree of climate change over the next 30 - 40 years due to historic emissions of greenhouse gases. The resulting risks can be managed by examining the likely impacts of climate change and taking steps to prepare for these, particularly through policies and activities that have long lifetimes or leave a significant legacy. This process, often referred to as **adaptation**, offers the best prospect of managing climate change impacts in the coming decades. The UK Government has a relatively progressive adaptation policy<sup>5</sup> that emphasises a staged, prioritised approach, tackling key policy areas first. Identified priorities include flood defence, water resources, land use planning and agriculture.

However, adaptation can only go so far towards tackling climate change. Emissions of greenhouse gases are the primary cause of climate change. Action to stabilise carbon dioxide at a level that avoids the most serious impacts of climate change requires measures to reduce greenhouse gas emissions. This **mitigation** process will lead to benefits mainly discernible in the second half of the century.

The Kyoto Protocol, drawn up in 1997, is an agreement that wealthy countries should cut emissions by 5.2 % from 1990 levels by 2008 - 12. The UK has a target reduction of 12.5 % and is on course to achieve this. The Government's Climate Change Programme<sup>6</sup> aims to reduce UK emissions by 20 % by 2010, with many measures directed at business. These include:

- **The Climate Change Levy - a tax on energy, offset by favourable 'green energy' tariffs and sectoral measures to achieve energy efficiency. The levy is revenue-neutral and funds the Carbon Trust to provide a lead on low carbon technology and innovation.**
- **The Renewables Obligation - a mandatory target to generate an increasing proportion of electricity from renewable sources (10 % by 2010).**
- **The UK Emissions Trading Scheme - launched in April 2002, but will be overtaken by the EU Emissions Trading Scheme, due to start in 2005.**
- **Other energy efficiency measures, including transport initiatives and strengthened building regulations.**

More recently the Energy White Paper<sup>7</sup> sets an aspiration to reduce UK emissions by 60% by 2050. The EU Directive on the energy efficiency of buildings comes into effect in 2006 and will require information on efficiency to be available to new purchasers and tenants, as well as anyone entering a 'public' building.

These measures affect the business environment now, requiring certain behaviours and affecting operating costs and, potentially, profitability. The expected benefits, chiefly reduced climate change and consequent damage, will not be felt for some time, and may be outweighed by increasing emissions elsewhere in the world.

3

**RISK TRANSFER (UNDERWRITING)  
AND RISK MANAGEMENT**

Underwriting - the process of deciding whether a customer can be offered insurance cover and on what terms - is the part of insurers' business most directly affected by climate change. The size and nature of claims experience in the past has always been a key factor in helping insurers make their underwriting decisions. Climate change will make it essential to focus more strongly on current and likely future trends and events.

In particular, climate change will increase the frequency and severity of extreme weather events, as well as longer-term trends in weather. The possibility of weather-related catastrophic losses will be much greater, raising issues for insurers of both of insurability and capacity. Insurance can only provide a suitable risk transfer mechanism if risks are kept to a manageable level. The insurance industry has a role, on behalf of its customers and shareholders, in highlighting the scale of the risks, and examining steps that are needed by all parties (including the Government) to manage risks and ensure that financial protection remains available for the majority of customers.

**(i) Property Insurance**

Climate change has a direct impact on property insurance precisely because it will increase the frequency and severity of extreme weather events, exactly those occasional, unexpected events covered under these policies. There is a risk that in some circumstances weather damage might rise to a point where insurance could become unaffordable or unavailable.

**Change to date**

Globally, economic losses due to natural catastrophes have increased seven-fold in the last 40 years, while insured losses have increased 14-fold<sup>8</sup>. In the UK storm and flood losses in the period 1998 - 2003 have totalled £6.2 billion, twice that of the previous period. Subsidence claims have not increased over the last 15 years, but annual costs vary considerably. There have been a number of significant events in recent years (Table 1).

Underwriting risk has changed. Small changes in the severity of extreme events can result in increases in damage of four or five times greater. On reasonable projections of extreme events, the pure risk rate for weather catastrophes is already rising at an unseen rate of 2 - 4 % per year.

**Table 1. Impacts of recent extreme weather events.**

1987	Hurricane-force winds caused over £1.2 billion in property damage, giving rise to 1 million claims in a single day.
1990	Storms and coastal flooding in January and February led to £2.1 billion in insurance claims, the highest figure for weather related claims to date. Over a 4 week period 3 million claims were received.
1995	Following the hot, dry summer subsidence claims rise to £326 million in 1995 and £333 million in the following year. It is difficult to disentangle subsequent claims from other contributory factors, including dry conditions in 1997. However claims remained at a raised level until 2000.
1998	Easter floods in 1998 led to the evacuation of 1500 people from their homes, and a cost to the insurance industry of around £500 million
2000	The UK experienced its wettest autumn for almost 300 years, with heavy rainfall leading to damage of 10,000 properties, and nearly £1 billion in insurance claims.
2003	The UK experienced its hottest summer temperatures on record, leaving insurers with close to £400 million in subsidence claims in that year alone.

Source: ABI Statistics

<sup>8</sup> Annual review of natural catastrophes 2003, Munich Re Topics, 2004

**Expected change**

The underlying risk from extreme weather will continue to increase in the future, and more than likely at an accelerated pace. The recent Government Foresight report on future flooding<sup>9</sup> estimates that annual average damage from flooding could increase from £1 billion to £2 - 21 billion by the end of the century if no action is taken to tackle climate change and its impacts (Box 2).

Initial calculations suggest that future claims costs could be two or three times higher than today's levels (Table 2). These estimates ignore the effects of socio-economic changes, such as the location and value of assets, and any substantial changes in Government policy.

Commercial property policies typically form the basis of business interruption cover. To date, this cover has been largely driven by fire risk management and underwriting. While fire and explosion damage still account for the majority of such claims (around 85 %) increasing severe weather events, particularly those resulting in prolonged electricity network failures, may change the pattern of future business interruption losses.

**Future action**

If society takes no action to prepare for the impacts of climate change, weather-related damage costs would continue to increase with inevitable consequences for the price and availability of insurance. However, public concern that cover could be widely withdrawn following the floods of Autumn 2000, and political readiness to improve flood defences, demonstrate there are alternatives to a purely reactive approach. The current effective partnership between the industry and Government on flooding<sup>10</sup> offers a model for dealing with future climate risks.

**Insurers**

- **Ensuring expected claims can be met - Funding expected claims is fundamental to insurers' business. The increasing use of risk pricing could enable future claims to be met, provided risks are assessed accurately. Historic claims and climate data will not provide adequate models so reliable alternatives need to be developed. Insurers will need to base their pricing on reasonable projections**
- **Providing realistic financial assessments of impacts - Risk-based pricing could prove an important mechanism for making society more aware of the risks that it faces and the benefits of risk reduction measures. Insurance market-forces could discourage development in the highest risk areas or the use of damage-susceptible construction techniques.**
- **Supporting resilient repair - Insurers can support the adaptation process both financially and through research and information. As an example, many insurers now offer flood-resilient reinstatement in high flood risk areas, provided the repairs are cost neutral, and will work in partnership with customers where additional funding is needed. Supporting this innovative approach, ABI has researched and published costed options<sup>11</sup>. Leading mortgage lenders have agreed to extend additional borrowing to meet financing shortfalls, where the customer has sufficient equity in the property.**

**Table 2. Preliminary estimates of future costs of weather insurance claims (£ million, in 2004 prices).**

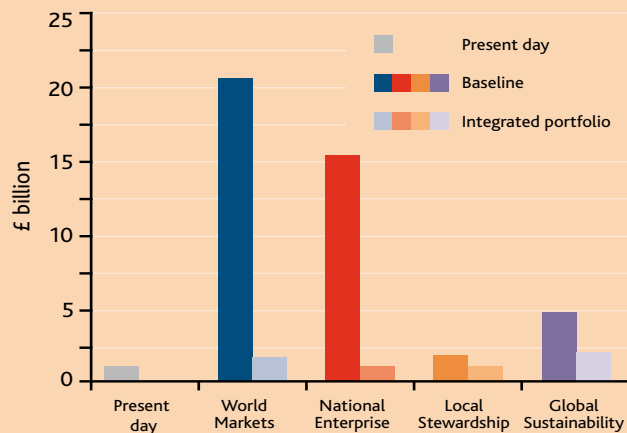
	Today		2050	
	Annual average	Extreme year	Annual average	Extreme year
Subsidence	300	600	600	1,200
Storm	400	2,500	800	7,500
Inland flood	400	1,500	800	4,500
Coastal flood	-	5,000	-	40,000 (London affected)

<sup>9</sup> Future flooding, Office of Science and Technology Foresight Programme, April 2004  
<sup>10</sup> Statement of Principles on the provision of flood cover, Association of British Insurers, September 2002  
<sup>11</sup> Flood Resilient Homes, Association of British Insurers, April 2004

**Box 2. Foresight future flooding report**

Assuming no changes in flood management policies and expenditure levels, this study estimated that annual losses would increase under every scenario studied by the end of the century. River and coastal flooding damages could increase from £1 billion per year to £20 billion per year. Localised urban drainage flooding will also increase, but more work is needed to quantify these effects. The distribution of areas at risk varies according to scenario, but the worst increases consistently affect the Lancashire/Humber corridor, the South-East coast, and most major estuaries.

Average annual flood damage in 2080s for the four future scenarios-baseline damages (assuming no change in policies) compared with damages following implementation of the integrated portfolios of responses



Key policy messages:

- 1 The need to prepare pro-actively for climate change.** Continuing with current policies would lead to huge increases in flood risk, with widespread impacts on society and the economy.
- 2 The need to start taking action today.** Bringing about effective change involves long planning horizons, both for the way assets are protected, and the way land and the built environment are managed.
- 3 The need to continue to invest in flood management.** £10 – 30 million additional investment per year in river and coastal defences would be needed to prevent stop flood damage costs increasing unsustainably.
- 4 The need to reduce global greenhouse gas emissions.** Stabilising emissions could decrease flood damage by at least 25 % (from £21 billion annual average damage to £15 billion), and could substantially reduce the cost of risk management measures.

Source: Future flooding, Office of Science and Technology Foresight Programme, April 2004

**ABI**

- **Engaging with Government on public policy issues -** The ABI's Statement of Principles provides a good model for a holistic approach to risk management and avoidance. The ABI and its member companies should engage with policymakers on the wider range of weather risks and the role of land use planning, building standards and other policy interventions in addressing risk, as well as Government's initiatives to reduce emissions. Discussions are already in hand on the Thames Gateway Project, for example.
- **Seeking to develop best practice -** The ABI is working with the Government's UK Climate Impacts Programme to understand the scientific principles behind adaptation, and consolidate them within guidelines for insurers and their customers.
- **Engaging with other stakeholders -** Property companies and lenders have similar interests to insurers in seeking to centre climate change risk. Greater engagement with these groups, and with the construction industry, would enable better management of risk, including the adaptation of existing, as opposed to new build, stock to future weather threats.

**Government and other stakeholders**

- **Providing policy signals -** Market forces can only drive climate change adaptation part of the way. Action in anticipation of climate change needs clear and consistent signals to ensure that all stakeholders are aware of the need to address risk so that homes and businesses are prepared for likely impacts.
- **Managing risk -** Containing or reducing climate change risk should be explicitly and consistently built into all public long-term infrastructure projects and policies, for example, by taking account of climate change impacts on flood defence spending and design, in strengthening planning policy for development in flood risk locations, in road planning and construction standards, and through including resilience to weather damage in revisions to Building Regulations.

**(ii) Other General Insurance Products**

**Change to date**

There is little information about the impact of recent climate changes on underwriting risks for other general insurance products - such as motor, travel, liability and construction. Anecdotal evidence suggests the possible future direction and scale of some impacts. For example, winter weather-related road accidents increased from 8 % of all accidents in 1998 - 99 to 12 % in 2001-02, and 25 % in the first half of 2003 - 04 winter<sup>12</sup>. During the Autumn 2000 floods, there was an estimated additional £25 million cost of motor claims.

**Expected change**

The overall effect on underwriting risks for these classes of business is unclear (Table 3). Product liability could throw up some unexpected impacts. Litigation may be brought against companies with high greenhouse gas emissions, similar to recent US tobacco cases (Box 3). Whether liability could be established is improbable, but this type of legal action consumes management time and legal costs, and is a risk to reputation. Swiss Re has announced that it will introduce climate change as a risk factor for 'Directors and Officers Liability' clients.

**Table 3. Potential impacts of climate change for non-property classes of general insurance**

Class of Business	New Challenges	New Opportunities
<b>Motor</b>	<p>Increased frequency of claims due to weather related accidents, both in heavy rain and hot weather</p> <p>Increased mileage due to longer, warmer summers</p>	<p>Decreased weather related claims due to less frequent fog and frost</p> <p>Improved driving technology, responding to more challenging driving conditions, may reduce the overall frequency and severity of accidents</p> <p>Reduced mileage due to higher fuel prices, concern for the environment, better public transport or adverse weather</p>
<b>Travel</b>	<p>Less demand, as more holidays taken in warmer UK, as temperatures in Mediterranean destinations become increasingly uncomfortable</p>	<p>More active lifestyles with warmer summers encouraging more activity holidays</p> <p>Increased demand to protect customers from weather related cancellations</p>
<b>Construction</b>	<p>More claims from wind and rain</p> <p>Unanticipated stress on materials and failures of novel systems</p>	<p>Reduced claims due to cold weather and new technologies adopted in response to climate change risks</p>
<b>Directors and Officers</b>	<p>Directors held liable for high emissions through civil action or regulation</p>	<p>Increased expectations of duty of care could lead to increased demand for insurance</p>
<b>Employers' Liability</b>	<p>Increased accidents at work in severe weather</p>	<p>Less depression in fine weather</p>

<sup>12</sup> Rain-related winter accidents on the increase - survey, Town and Country Assistance, Press Notice, 27 January 2004

**Box 3. Climate change liability**

Businesses responsible for high emissions of greenhouse gases could be held liable for the damage that is caused by climate change. The Alliance of Small Island States, and more recently the Climate Justice Network have suggested that compensation should be paid for impacts such as communities affected by sea level rise.

On 22 August 2002, Friends of the Earth, Greenpeace and the City of Boulder, Colorado launched a suit against two federal agencies, the Export-Import Bank and the Overseas Private Investment Corporation, for lending illegally over US\$32 billion to fossil fuel export projects without assessing their contribution to climate change. Oakland, California has now joined the plaintiffs, who are all citing potential impacts in the USA as their cause.

**Future action**

**Insurers**

- **Ensuring that underwriting concerns are fully understood** - Although less exposed than property classes, the potential impacts on motor and other liability products should not be ignored. Insurers should carry out preliminary studies such as examining the need for new climate-related factors in underwriting Employers' Liability.

**ABI**

- **Ensuring that Government and other stakeholders understand changing risks** - Climate risks will affect specific trades and sectors differently. The ABI should work with other relevant trade associations and professional bodies to identify and address these, where appropriate, through proposing public policy initiatives.

**Government and other stakeholders**

- **Managing risk** - Typically impacts that are borne by wider society or future generations are not well managed through market mechanisms alone, although market-based mechanisms are often the most economically efficient. Government will need to take the lead in managing certain types of risk through mitigation and adaptation measures. For example, potential environmental damage from brownfield sites may require flood defences as well as appropriate remediation measures. Road construction and vehicle design may need to change in order to reduce weather related accidents.

<sup>13</sup> Annual review: of natural catastrophes 2003, Munich Re Topics, 2004

<sup>14</sup> Health effects of climate change in the UK, Department of Health, August 2002

**(iii) Health**

**Change to date**

The 2003 heatwave in Europe, with temperatures up to 6 °C hotter than the twentieth century average, contributed to many hospital admissions and the deaths of 27,000 people<sup>13</sup>. The potential impacts on the health insurance industry were much bigger than previously expected.

**Expected change**

The net effect of climate change on health insurance is currently unclear, as the potential impacts are mixed (Table 4).

Some factors affecting health or 'wellness' may have beneficial effects on health policy claims. However, increased health interventions driven by heat waves, skin cancer and injuries caused in extreme weather events could offset these. In the UK, climate-related diseases are not thought to be a major health risk, but food poisoning could become more prevalent and a mild form of malaria could become endemic in parts of SE England<sup>14</sup>.

Over the longer term increased life expectancies may be combined with poorer health and this would increase burdens on healthcare resources. This may drive a change in the relationship between the state and private sector providers.

**Table 4. Potential impacts of climate change for health**

New Challenges	New Opportunities
Greater heat stress and summer mortality	Greatly reduced winter illness and mortality
Increased incidence of skin cancer, due to more outdoor lifestyle	More active lifestyle with warmer summers
Greater incidence of food poisoning due to longer, hotter summers	Greater availability of a range of fresh food
Increased occurrence of endemic malaria due to warmer climate	
Increased exotic diseases through greater global migration from drought stricken areas	

Future action

Insurers

- **Planning for long term health needs** - Health insurers will need to gain a better understanding of future health trends driven by climate change impacts in order both to underwrite correctly and to ensure customers have access to the appropriate physical assets and services. This should include an assessment of regional impacts (both demographic and climate) and of NHS capabilities.

ABI

- **Engaging with Government on public policy issues** - The ABI and its member companies will need to work with Government and the National Health Service in developing public policy responses to the emerging climate change risks. These should include advice and preventative measures as well as research into improved interventions, particularly for those conditions that are currently rare but may be more prevalent in the future.

Government and other stakeholders

- **Managing risk** - Government is now giving much greater emphasis to prevention measures and promoting wellbeing. The Food Standards Agency already publicises the need to avoid food poisoning through, for example, inadequate cooking on barbeques. Further education on skincare to avoid melanomas will be needed. Action on fuel poverty, which may contribute to heat distress and illness amongst the elderly, will also be necessary.
- **Providing services** - The National Health Service may need to adjust its provision to meet changing needs. There may be regional effects, both due to retirement settlement patterns and the differential climate changes across the UK.

(iv) Life and Pensions

Annuities and pension products are subject to many current changes - for instance in both demographic and economic assumptions. Climate change is likely to be an additional, though more marginal, factor. Warmer winters could reduce cold-related deaths in the UK by 20,000 per year, marginally offset by increased summer heat-related deaths of 2,800 per year.<sup>15</sup>

Future action

- **Planning for future pension needs** - Insurers and the Government should consider the potential impacts of climate change on longevity and morbidity for provision of pension products.

<sup>15</sup> Health effects of climate change in the UK, Department of Health, August 2002

### (v) New Products

Climate change creates new customer needs, which could require new or modified insurance products. Some may be more suitable for the Lloyd's market or companies operating in the London market due to their international dimension, while others may be of more interest to companies operating mainly within domestic markets.

#### Renewable energy

New energy technologies such as renewable sources (wind, wave and solar power) will require insurance. These may be challenging to underwrite without previous claims experience. However, onshore wind turbines are now commercially insurable. The market potential is very large since UK statutory renewable energy targets could rise to 20 % of electricity generating capacity by 2020. The Kyoto Protocol offers incentives to export such projects.

#### Liability and emissions allowances

Greater regulation will lead to increasing controls on greenhouse gas emissions. The UK has already established the first economy-wide emissions trading scheme, and the EU scheme will come into force in 2005. As a result business customers will have new liabilities and assets. The implications for business interruption cover attached to commercial property policies also need to be thought through.

#### Alternative Risk Transfer

Alternative Risk Transfer (ART) markets may also expand (Box 4). Insurers and large corporations are already experimenting with catastrophe bonds as an option instead of reinsurance. In the USA many corporations and local government bodies use weather derivatives to smooth their financial performance. ART tools are useful complements to conventional (re)insurance, but the accounting and taxation rules currently make it difficult to offer these products.

#### International aid

Climate change will particularly affect many developing countries, which will also have least capacity to deal with the impacts. International treaty obligations mean that OECD Governments may support risk management approaches rather than disaster relief. These may well be based on insurance methods with opportunities to offer administrative services without necessarily carrying the risk itself.

The Department for International Development has promoted the development of catastrophe cover with contingent finance for small countries, but without much success. Other ideas include multi-layered public/private catastrophe insurance (one scheme is now in place for Turkish earthquake cover) and providing micro-insurance alongside micro-finance to the poor in developing countries.

### Box 4. Alternative Risk Transfer mechanisms

Alternative Risk Transfer is the term given to unconventional insurance arrangements. One of the commonest is **captive insurance**, where a large corporate places its risks within its own wholly-owned insurance subsidiary.

Insufficient reinsurance capacity has led to experimentation with **catastrophe bonds**: these are financial contracts which pay out, not on proof of a loss to the insured, but on the fulfilment of a trigger condition, for example a Category-4 hurricane striking mainland USA. The benefit is that they are simple to administer, but they have proved expensive to set up. The capital is provided by investors, who receive a superior interest rate, but run the risk of losing their return, and even the capital in some contracts.

**Weather derivatives** also pay out on a specified trigger, for example, temperature over a specified period, not on proof of loss. They apply in situations where profitability is sensitive to even moderate deviations from the norm, not catastrophes. In this case, the derivative is usually purchased by another party who wants to avoid or 'hedge' risk in the opposite direction, and an active market in these securities can develop. However, a company could also accumulate a book of weather contracts, as a profit centre in its own right.



## INVESTMENTS

### (i) Equities

#### Change to date

Investment patterns have been driven by socio-economic changes rather than climate change to date. The rise of ice-cream manufacturers has been associated with greater ownership of domestic freezers, not hotter summer days. Since weather changes have been fairly gradual so far, there has been time to adjust the balance of portfolios consistent with earnings experience and expectation, rather than associating these with climate change.

Socially Responsible Investment (SRI) funds, where investment decisions are as much based on ethical and environmental considerations as earnings potential, consider climate change effects. This is explicit in the contract between customer and fund. In the past it has been assumed that there is a degree of trade off between profitability and SRI status, although some commentators now question this, as some funds have performed ahead of the general stock indices. In addition it is suggested that companies with well developed Corporate Social Responsibility (CSR) policies and climate change risk strategies often perform well and the presence of such policies may be taken as an indicator of future equity value. This may be explained by the high level of business and risk management evident in the executives of such companies, rather than as a direct and immediate benefit of these policies.

#### Expected change

Two factors influence the ability of investment funds to anticipate climate change effects: the lack of clear information and impeded information flows, and the short time horizons on which fund managers work. Given the uncertainties currently affecting climate change predictions, the main driver, assuming gradual climate change, will be investor requirements coupled with Government regulations on emissions. If investor requirements remain short term returns, fund managers will have no option other than to provide these. However if investors increasingly require climate change to be incorporated into funds' risk management strategies, that will drive a shift in stance. Emissions trading is now starting to have an effect on returns.

Delaying action will leave funds exposed to any abrupt changes or severe weather events that impact differentially on specific economic sectors. Equally sudden policy changes on, say, emissions standards may drastically curtail earnings potentials both within and between sectors (Box 5).

### Box 5. Vehicle manufacturing

Carbon constraints are already in place, and will increasingly influence vehicle design. There are several technologies that might fill this need, with varying potential and technical problems to overcome. Differences between manufacturers' product lines will lead to a range of costs to meet new standards, from \$650 per car for BMW to less than \$25 for Honda. Companies also have different capacities and face different risks in switching to alternative drive technologies in the short and medium term. The impact of consumer preferences is unknown.

One authoritative review concluded that Toyota was 'clear leader' with a strong position in all three major technologies (diesel, hybrid, and fuel-cell), giving it nearly 10 % additional shareholder value compared to business-as-usual, while Ford could face a decline of 15 % in value because of its thirsty vehicles, and low R&D in this area.

Source: Changing Drivers, Sustainable Asset Management and World Resources Institute, 2003

Similarly, swings in public opinion, such as those associated with the Brent Spar affair, may adversely affect analyst attitudes and equity value where the public perceives that the environmental impact of a company's operations is unacceptable.

There will be new investment opportunities. Sustainable energy and its attendant technologies is one readily identifiable opportunity (Box 6). Industries with high greenhouse gas emissions that are able to adapt readily and at low cost may develop new income streams from carbon trading. These may actually enable them to profit in situations where others are under increased pressure, as the market value of 'carbon' increases. Initiatives such as the Carbon Disclosure Project will start to provide more information on exposure, but understanding of the risks involved is still limited.

### Box 6. UNEP Financial Initiative (UNEP FI) and renewable energy

UNEP FI is an alliance between the United Nations Environment Programme and over 200 financial institutions, including major UK insurers and banks. The latest UNEP FI Briefing (released on 2 June 2004 in Bonn) reports that renewables have great environmental and social benefits, and that the market for clean energy technologies could be worth \$1.9 trillion by 2020. "The financial sector has a key role to play in developing and promoting this market. Renewable energy is both a solution and a business opportunity. However there are still some significant barriers to capturing this promise. The most important thing that policymakers can do is create confidence in the long-term future of the renewables market by policies that make 'the deal on the table' attractive".

### **New products**

The advent of carbon trading has already opened new trading markets, which could be incorporated into investment strategies. Other avenues to explore include developing climate-theme funds focussing on companies, sectors or countries that may perform better under positive policies, and mezzanine finance, providing capital to fill the funding gap between debt and equity for renewable-energy companies or projects.

### **(ii) Property Investment**

Property is responsible, in its construction, use and demolition for around half of all CO<sub>2</sub> emissions<sup>16</sup>. It is therefore a natural focus for climate change mitigation measures and this is where most activity has occurred to date. However, as property insurance claims experience demonstrates, the effects of climate change will also impact most heavily on the built environment, with implications for investment returns.

#### **Changes to date**

The property investment industry has considered low energy new buildings. Such energy and climate change related measures have had relatively slow take up since the market has not reflected environmental and running cost benefits in asset valuations and market pricing. More work is needed on how these issues impact on rental growth, rates of depreciation and risk premia attached to investment properties. Leading insurers are currently undertaking work in this area. UK energy prices are generally low and emissions regulations are only just beginning to bite. New buildings represent a very small proportion of the total building stock and it will take a long time for environmental benefits to be felt.

The location and construction of portfolio properties are also important aspects of climate-proofing investments, avoiding damage and reducing maintenance costs. To date whole life costings and returns have been relatively undeveloped. Improved resilience to climate damage is mainly at the research stage, with construction quality standards schemes such as BREEAM<sup>17</sup> concentrating exclusively on mitigation (energy efficiency) rather than adaptation measures. Some high risk, waterside, locations may even provide premium returns. So long as these cover the increased risks this is, of course, a perfectly rational strategy.

### **Expected change**

Emissions are now starting to rise after a 20 % fall following the closure of coal-fired power stations. The Energy White Paper<sup>18</sup> proposed measures to achieve a 60 % reduction by 2050, mainly through a combination of improved energy efficiency and the use of non-polluting renewable energy.

In the short to medium term it is likely that the key driver for change will be legislation. The EU Directive on the Energy Performance of Buildings, which comes into effect in 2006, will impact the market significantly. It will require information on the energy efficiency of all buildings to be available to new purchasers, tenants or anyone entering a 'public' building. This greater transparency, coupled with emissions limits, could lead to higher awareness and concern by tenants and landlords, affecting the lettable and saleability of properties and therefore their values.

#### **New opportunities**

Increasing severe weather events affecting security of electricity supply, coupled with decommissioning of ageing nuclear generators, could stimulate premium demand for on-site generation. Energy efficiency and emissions regulations may encourage take up of renewables to meet this need. Increasing demand for building comfort, particularly in more frequent hot summers, could also add a premium for thermally efficient properties, avoiding or minimising the use of air conditioning.

<sup>16</sup> Association for the Conservation of Energy figures

<sup>17</sup> BRE Environmental Assessment Method, [http://www.bre.co.uk/services/BREEAM\\_and\\_EcoHomes.html](http://www.bre.co.uk/services/BREEAM_and_EcoHomes.html)

<sup>18</sup> Our energy future - creating a low carbon economy, Department of Trade and Industry, February 2003

### (iii) Securities and Bonds

Government securities may be affected by rising public borrowing driven by climate change. OECD countries should absorb these costs relatively easily. For example, flood damage in the UK may increase to between £2 - 20 billion by 2080, but economic growth is estimated as rising by a factor of 2 - 14 in the same model<sup>19</sup>. The UK currently invests about 0.05 % of GDP in flood and coastal defences, annually. Elsewhere greater impacts in low-lying countries and islands, and the limited capacity of small and fragile economies to respond, could have quite significant impacts on both Government finance and currency movements.

Likewise variable corporate performance due to climate change impacts would have effects on the value of corporate bonds.

### (iv) General insurers' investment portfolios

The windstorms of 1990 did not threaten the solvency of general insurers, but did give rise to liquidity issues with some forced selling of equities<sup>20</sup>. Different strategies may need to be developed if sudden shocks to markets, with knock on impacts on insurers' other funds, are to be avoided in a future where severe weather events are increasingly frequent.

#### Future actions

##### Insurers

- **Understanding investment risks - Climate change issues, long seen as a specialist interest, are impacting more widely through the changing political and regulatory environment. This will have implications for investment strategies which fiduciaries, fund managers, and advisers will need to understand so as to manage the risks and opportunities in, their portfolios.**

##### ABI

- **Engaging with Government on regulation and public policy issues - As further initiatives to deliver emissions reductions and address adaptation issues are considered, the industry, through the ABI, will need to inform policy debate by costing the implications of proposals, maximising benefits whilst minimising costs and burdens. This implies that, wherever possible, solutions should be market based, proportionate and clearly signalled sufficiently in advance to avoid shocks to the investment market.**
- **Communicating the industry's position to wider stakeholders - The high profile debate of climate change issues gives rise to misconceptions of business views, particularly in the absence of comment. The ABI needs to communicate the industry's position clearly to ensure a rational, economically based debate.**

##### Government and other stakeholders

- **Proportionate and well signalled regulation - In managing climate change risks, the Government needs to take account of the economic effects of proposed policies and their implementation to ensure a high growth, low emissions economy.**

<sup>19</sup> Future flooding, Office of Science and Technology Foresight Programme, April 2004

<sup>20</sup> London's Warming, London Climate Change Partnership, October 2002

## IN-HOUSE OPERATIONS

### Changes to date

All organisations generate a 'footprint' of greenhouse gases. Many insurers have adopted environmental measures as part of their corporate social responsibility policies addressing broader social and ethical issues. Environmental strategies might include the reduction of energy consumption, improvement of waste management and setting acceptable standards for suppliers (Box 7). It could be argued that the insurance sector is relatively 'clean', but in fact a large insurance company may consume as much electricity as a small town. Initiatives such as FORGE (Financial Organisations' Review and Guidance on the Environment) have highlighted the need for such measures and provided guidelines for best practice within the context of Corporate Social Responsibility (CSR).

### Box 7. Green housekeeping

Aviva Group achieved a 22 % reduction in CO<sub>2</sub> emissions during 2003. Prudential measures and sets targets for emissions and energy consumption per member of staff, and is also measuring the performance of its property investment portfolio. Energy consumption at CIS's head office has been stabilised at a level significantly below the government's benchmark for such accommodation with business air, rail and car fleet travel related emissions all reduced over the period 2000 - 2002.

Additional insight is provided by the project Carbon Disclosure (CDP), which is an alliance of 95 institutional investors, managing US\$10 trillion of assets, including many major UK investors. The project aims to improve the quality of investor information on corporate exposure and performance relating to climate change, based on a simple questionnaire sent annually to the FT Global 500. The second report was released on 19 May 2004.

All three UK-incorporated insurers in FT500 (Aviva, Legal and General, Prudential) have responded and achieve favourable ratings compared with insurers in other countries in terms of the actions they are taking. They all perceive climate change as a business issue, have allocated responsibility for dealing with it, and are managing their internal emissions. Prudential has also set formal internal emission targets and has begun to measure the emissions produced by its property investment portfolio.

However, the highly competitive nature of the market prevents the uptake of mitigation or adaptation measures that do not provide business benefits. Nevertheless insurers, like all businesses, observe regulatory requirements, for example, the increased thermal properties required of replacement and new windows, in a revision to Building Regulations in 2002.

### Expected change

In effect individual companies set the benchmarks for others, and are continuing to pursue environmental strategies where these produce business benefits, such as reduced energy costs or market positioning. New technologies offer possible further savings. Paperless billing and renewal processes will reduce emissions from postage and courier services and may reduce paper use.

### Future actions

#### Insurers

- **Examine wider benefits in seeking cost reductions - Insurers constantly review their cost bases and in doing so could produce wider environmental benefits.**
- **Resilience to extreme events - In-house assets and processes should be reviewed for vulnerability to extreme events.**

#### ABI

- **Gain greater recognition for industry achievements - Leading members are already producing benefits through their environmental and CSR programmes. The ABI should ensure that these are recognised by Government and other stakeholders.**
- **Improve insurers' understanding of opportunities - Whilst cost reductions are a competitive issue, the wider benefits of cost neutral measures are less easy to understand. The ABI should, through its work with the UK Climate Impacts Programme and others, provide information to members on these benefits.**

#### Government and other stakeholders

- **Support innovation - As the 'easy wins' are realised, it will become increasingly difficult for business to identify new opportunities to reduce emissions and take up adaptation measures. Government should support those willing to innovate and promote successful measures in the wider business community.**

6

**COMMUNICATIONS AND REPUTATIONAL ISSUES**

Change is often threatening and difficult to cope with. It brings opportunities for some, but problems for others. Insurers are often the messengers that change is happening, because the prices they charge, the conditions they attach to their policies, and sometimes the very availability of insurance, reflect rising or falling risks in our society. And, as acknowledged in this report, insurers have a key responsibility in helping their customers and public authorities to identify how risks can be managed, reduced, and where possible averted.

All this means that insurers will need to communicate very effectively about climate change with all stakeholders. They run a reputational risk otherwise, since they may be seen as the bearers of unpopular messages and blamed for factors which they alone cannot control.

In fact, there is the potential for insurers to play an even more positive role in society than they already do, and for this to be more widely recognised. For instance, many health and safety initiatives and prevention measures were originally driven by insurers. Measures from industrial boiler safety standards to crime prevention measures developed from insurer action before Government engaged in these social issues.

The UK insurance industry, often through the ABI, continues to be pro-active in tackling the major issues facing society, where the cost or provision of insurance is affected by risk management, public policy and the legal framework. Many leading insurers identify such engagement as one of the ways in which their companies can demonstrate their commitment as socially responsible partners, managing their own business risks and adding shareholder value in the process.

**The Way Forward**

It is easy to portray climate change as a threat. It certainly poses significant challenges to insurers. But it also offers a range of opportunities, not just in offering new products to meet customers' changing needs, but in keeping the industry at the heart of society, meeting community and national needs whilst properly pursuing profit. Insurers will only be able to provide risk transfer, investment and employment opportunities so long as they are both solvent and generating sufficient margin to invest in the future. This puts a dual duty on insurers: to operate profitably today and to prepare for the future.

How to respond to climate change will ultimately be a business decision for insurers. This report has shown that climate change is already affecting insurers' business - both through increased incidence of weather-related property damage and changes in regulation on carbon emissions. Measures that offer more immediate business benefits will be taken up most readily. However, measures that are profitable, but also contribute to tackling climate change, could offer wider societal benefits, and will position the insurance industry in the centre of the debate on climate change for years to come.

Just as the Chief Scientist to the Government identified the ideal future as low emissions, high growth, for insurers the Holy Grail could be defined as

WIN	WIN	WIN	WIN
Business benefits	Mitigation benefits	Adaptation benefits	Reputational benefits

Insurers as businesses will make rational decisions regarding cost cutting and improved returns and profits. However, measures scoring highly on mitigation, adaptation and even future reputation, but low on immediate/near term profitability will need to be dealt with by engaging Government and other stakeholders who also stand to gain in the future from these actions. Insurers cannot 'solve' climate change for society, but they can and are contributing to its management.

The ABI will discuss with its members how this process can be taken forward.





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