Risks & opportunities of climate change for the insurance sector

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Agenda

- Science update
- Impact on insurance industry
- Politics & economics
- Opportunities for the insurance industry
- Swiss Re’s climate change strategy
Global warming is a fact

650,000 years of carbon dioxide concentration [ppm CO₂]
Main greenhouse-gas emitters

**CO₂ in t / capita (2004):**

- Qatar: 69.2
- USA: 20.4
- Canada: 20.0
- Australia: 16.3
- United Kingdom: 9.79
- Switzerland: 5.6
- Mexico 4.24


Main source: developed nations
What is going on?

Source: ‘Images from The Greenhouse Effect and Climate Change’, Australian Bureau of Meteorology, 2005 (copyright Commonwealth of Australia reproduced by permission)
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Development of insured losses – 1970–2006:

USD bn, at 2006 prices

Katrina Rita Wilma (2005)
Ivan Charley Frances (2004)
Andrew (1992)
Lothar (1999)
Sept. 11

Insured natural catastrophe losses 1970-2006 (excl. EQ, USD mio, price level 2006)

Source: Swiss Re sigma Catastrophe database
Economic growth and urbanization

- The single most important factor contribution to rising losses are changes in demographics and economic wealth
- The most important counter measure: reduce vulnerability to extreme weather
  - Regional planning
  - Construction codes
  - Protection measures
  - Emergency organization
Heatwave 2003

August 2003 temperatures relative to 2000-2002, 2004
Source: Reto Stöckli, ETH/NASA, MODIS / Prof. Christoph Schär

The Paris heat wave: deaths and temperatures

Source: "Climate Change Futures", Harvard Medical School, 2005
Changes in the physical environment

Emerging and Resurgent Infectious Diseases Since 1990

Infectious disease is on the increase

- Emerging disease
- Resurgent disease

Source: New Scientist (June 2004)
Climate litigation

- **Type: Challenge regulatory in/action**
  - 2007 - Commonwealth of Massachusetts v. EPA: Court ruled in favor of Massachusetts
  - 2007 - EPA et al. vs. Duke Energy: Court ruled in favor of EPA

- **Type: Plaintiffs seek relief against emitters of greenhouse gases.**
  Claims are based upon common-law ‘public nuisance’ theories.

- **Type: Seeking the recovery of damages from existing injury**
  - damage allegedly attributable to the effects of global warming caused by corporations past conduct. Hurricane Katrina-related cases:
    - 2006 - People of the State of California ex rel. Lockyer vs. General Motors Corp.: pending

- **Type: Lawsuits against corporate directors and officers**
  - failing to disclose sufficiently the nature and extent of potential liability exposures/
    failing to adopt more environmentally-friendly business practices
  - 2006 – no lawsuits yet, only articles in journals and shareholder proxies
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The economics of climate change – Stern review

An economic review, Sir Nicholas Stern, Head of the UK Government Economic Service and former World Bank Chief Economist:

- The cost of unabated climate change would be equivalent to at least 5% of GDP each year. Worst case cost could be equivalent to 20% of GDP or more.

- The costs of action to reduce greenhouse gas emissions to avoid the worst impacts of climate change can be limited to around 1% of global GDP each year.

- Possible extinction of 15-40% of species with +2 degree celcius

- According to Sir Stern, “Climate change is the greatest market failure the world has seen.”

- Effective action requires a global policy response, guided by long-term goals and strong frameworks for co-operation.

## Climate change regulative landscape

<table>
<thead>
<tr>
<th>Region</th>
<th>Implemented binding targets*</th>
<th>Planned binding or aspirational emission targets*</th>
<th>Frameworks/ Markets</th>
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</thead>
<tbody>
<tr>
<td>World:</td>
<td>Kyoto Protocol: -5.2% by 2012</td>
<td>- Post 2012 targets negotiations start COP/MOP2007</td>
<td>- Kyoto (CDM, JI)</td>
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<tr>
<td>Europe:</td>
<td>- Kyoto target: 8% by 2012</td>
<td>- UK: -60% target by 2050 (binding, decision in 2007 legislature)</td>
<td>- EU ETS related to Kyoto - UK ETS</td>
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<td>- EU: -20% (-30%) target by 2020 (awaiting country split)</td>
<td>- ...</td>
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<td>US:</td>
<td>- CA AB 32: -25% by 2020</td>
<td>- 18% reduction in carbon intensity from 2002-2012 (aspirational)</td>
<td>- CCX - RGGI</td>
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<td>- US Mayors climate protection agreement:</td>
<td>- Pending cap and trade proposals: Bingaman, Feinstein-Carper, Kerry-Snowe, McCain-Lieberman, Sanders-Boxer</td>
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<td>- 7% by 2012</td>
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<td></td>
<td>- CA: -80% by 2050</td>
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<td>- New Mexico: -70% by 2050</td>
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<td>- ...</td>
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<td>Australasia:</td>
<td>- Japan: - 6% by 2012</td>
<td>- China: -846 mio tCO2e by 2020</td>
<td>- AUS ETS (dev)</td>
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<td></td>
<td></td>
<td>- Australia: +8% above 1990 levels by 2012</td>
<td>- Hong Kong/Guangdong pilot</td>
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<td>- ...</td>
<td>- Beijing announced trading scheme plans</td>
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</tbody>
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A public policy response should have various elements:

- Globally recognised long-term emission reduction goal
- International framework including emerging markets
- Market-based mechanisms
- Regulatory incentives
- Adaptation measures to be adopted
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New insurance solutions

- **Energy savings insurance**
  Protecting the installer or owner of an energy efficiency project from under-achievement of predicted energy savings

- **Renewable energy project insurance**
  Covering performance risk for renewable energy systems, e.g. through wind power derivatives

- **Green building insurance:**
  Replacing conventional property damaged or destroyed in a covered loss with improved green and/or energy-efficient property

- **Pay-as-you drive insurance**
  Insurance premiums are charged according to actual miles driven

- **Carbon insurance**
  Covering business and performance risks associated with projects designed to achieve emission reduction certificates
Opportunities for re/insurance: the growing weather market

1997 first weather derivative transaction in the US energy sector spurred by deregulation of energy industry

Strong market growth to aggregate notional value of USD 45 bn

Market demand from energy sector (mainly US & EU) and agro sector (mainly Africa, Asia [India], Australia)

Key players – (re)insurance, banks, energy traders, hedge funds

CME= Chicago Mercantile Exchange; OTC= over the counter trade

Source: PwC 2006 Market survey
The carbon emissions market

- Global carbon market grew in value to an estimated US$30 billion (end 2006) and is estimated to grow at a rate of around 20% p.a. for the next 5 years.

- Dominated by European Union Emissions Trading Scheme (EU ETS)
  - Volume of EU Allowances (EUA): 764 million tonnes CO2e

Figure 1: EU-ETS Takes All: Shares of Volume (left) and Value (right) Transacted in the Carbon Market (2006 until September 30)

Source: European Climate Exchange Market Update - January 2007; States and trends of the carbon market 2006 Q3, Worldbank, IETA, October 2006
Leverage opportunities:
Clean energy market update 2006

The market for biofuels hit USD15.7 billion globally in 2005, up more than 15% from the previous year. Biofuels will grow from USD15.7 billion in 2005 to USD 52.5 billion by 2015.

Wind power (new installation capital costs) will expand from USD 11.8 billion in 2005 to USD 48.5 billion in 2015.

Solar photovoltaics (including modules, system components, and installation) will grow from an USD 11.2 billion industry in 2005 to USD 51.1 billion by 2015.

Fuel cell and distributed hydrogen market will grow from USD 1.2 billion last year to USD 15.1 billion by 2015.

In total, the four clean-energy technologies, which equaled USD 40 billion in 2005, are projected to grow to USD 167 billion within the coming decade.
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Swiss Re’s climate change strategy

Four strategic priorities:

1. Understand the risk
2. Developing products & services for mitigation and adaptation
3. Risk Dialogue and advocacy
4. Addressing own Carbon footprint
For more information see:
www.swissre.com/climatechange
Thank you!