From Risk to Opportunity
Climate Change and the Insurance Industry

Presented to 2007 Frankel Symposium: Coping with Global Warming
UCLA School of Law
March 2, 2007

Evan Mills, Ph.D.
Staff Scientist
U.S. Department of Energy
Lawrence Berkeley National Laboratory
Outline

- Overview of the insurance sector
- Risks from climate change
- Risks from responses
- Opportunities

Thread:

*False dichotomy of reducing emissions vs. reducing impacts*
$3.4 trillion world insurance market

- World’s biggest industry; enormous political influence
- Most “lines” vulnerable (property, liability, life, health)
- Availability and affordability -- major public policy issues

Source: Swiss Re, Sigma No. 5/2005
Climate Change: Intersection with insurance and law

Insurers are....
- integrators
- risk managers
- adaptive capacity
- vulnerable
- selective
- potential part of solution
Insurance-relevant consequences

- Property damage
- Mold/moisture
- Forest products
- Agricultural losses
- Business interruption
- Roadway

- Injury
- Infectious diseases
- Heat stress
- Respiratory
- Pollutant releases
- Food poisoning
- Mental health
- Nutrition/water

- General
- Product
- Environmental
- Professional
- Political Risk
- Roadway
“CATs” play a key role in profitability
P&C Combined Ratios: 1982-2004
(excludes investment gains)

Note: Catastrophes are not the only climate change impact of concern

Source: AM Best, Aggregates & Averages
"We'd be out of our minds if we wrote weather insurance on the opinion global warming would have no effect at all."

- Warren Buffett
2006 annual shareholder meeting

Non-climate factors play a role, but…

• Trends consistent w/ observed change
• Why are non-weather losses level?
• Even worse without prevention efforts

Notes: All economic values inflation-adjusted to 2004 levels. Losses from Munich Re NatCat Service; premiums from Swiss Re, Sigma. Values for 2005 are LBNL estimates.
Risk is OK; Uncertainty is not

The ratio of losses to premium revenues is increasing; So is the volatility

Unknowns:
- Underwriting
- Operations
- Investments
- Shareholders
- Reputation
- Regulation
- Insurability
Extremes shifting *more* than averages

Source: IPCC 4th Assessment Report
Rare extremes cause most of the damages & insured losses

The European heat wave of Summer 2003

Event was “six-sigmas” outside of norm. 16°F above average in France and Germany was a 1-in-10,000 event to 1-in-46,000 event

Risks are associated with responses to climate change

- **Impact reduction** – efforts to decrease vulnerability
  - Integrity of defenses
  - Risk of mal-adaptation

- **Emissions reduction** – supply- and demand-side energy choices
  - Green Buildings
  - Nuclear power
  - Hydrogen energy
  - Renewable energy
  - Carbon capture & storage
Carbon capture and storage (CCS)

- Lake Nyos - 1986 (Cameroon): Natural CO$_2$ leak suffocated 1800 people, 3500 farm animals
From Risk … to Opportunity

The insurance sector has a key role to play in helping to mitigate the effects of climate change … and by developing new products and solutions that can support emerging greenhouse-gas and renewable energy markets.

- Marsh & McLennan

New Report:
~220 examples; ~120 insurers [modest beginnings]
Top-10 practical strategies

1. Promoting loss prevention
2. Crafting innovative insurance products
3. Providing new customer services
4. Participating in carbon markets
5. Rewarding good behavior
6. Investing in solutions
7. Conducting research
8. Participating in the public policy discussions
9. Leading by example
10. Educating each other
Promoting loss prevention

• Meets *Institute for Business and Home Safety’s* “Fortified… for safer living” stds.
  – Wind-resistant rigid foam panel walls and multi-glazed windows
  – Ice-dam resistant
  – Mold resistant
  – Water-resistant insulation

BASF Home - Patterson NJ

Some insurers are giving premium credits….
Crafting innovative insurance products

• **Fireman’s Fund**: first-ever “Green-Buildings Insurance”
  – Premium credits for green features
  – Rebuild to green standards after loss

• **Munich Re**: geothermal energy production insurance

• **Lloyds**: Energy Savings Insurance
Providing new customer services

*Insurance Australia Group* offering on-line automobile carbon-offset service for customers

Participating in carbon markets

- *AIG, Marsh*, others offering carbon project risk-management consulting services; insurance

Rewarding good behavior

- **Travelers** offers 10% premium discount to drivers of hybrids

- **GMAC** offers “pay-as-you-drive” insurance discounts of up to 40%
Investing in solutions

- **Tokio Marine & Nichido** has reforested 7,500 acres of mangroves in Indonesia, Thailand, Philippines, Myanmar and Vietnam. 5,000 more acres in progress

Conducting research

Expected increase in annual windstorm loss in Europe

*Swiss Re*

*Increase in annual expected loss for Europe (EUR), Denmark (DNK), Germany (DEU), Sweden (SWE), Belgium (BEL), France (FRA) and the UK (GBR) over the period 1975 to 2085 (in %). The broad bars represent the mean value of the climatic models, and the error bars show the spread of the results from all models.*
Participating in public policy discussions

- **American Insurance Association** - Endorsing public transportation; reduced speed limits; telecommuting based on win-win benefits to insurers

- **Association of British Insurers** advising City of London on land-use planning and flood defenses
Leading by example

Carbon Disclosure Project
Insurers’ responses: AIG, Aon, Marsh & McLennan, MBIA, Safeco, St. Paul Travelers, Unum Provident

Swiss Re’s “Gherkin” building (London)
- Energy efficient
- Daylighting
- Natural ventilation

Source: http://www.cdproject.net/
Educating each other

• Swiss Re has run full-page adds on climate change in major insurance trade journals for several years
Bottom line....

• The insurance sector - *is a powerhouse*
• Risks from climate change - *are material*
• Risks from responses - *are under-appreciated*
• Opportunities - *very significant; off to good start*
• Emission vs. impact reduction: *strong synergisms*
Emission-/Impact-reduction Synergisms Avoiding heat deaths thru energy efficiency

Source: Lawrence Berkeley National Laboratory
http://insurance.lbl.gov

Evan Mills, Ph.D.
MS 90-4000
Lawrence Berkeley National Laboratory
Berkeley, CA 94720 USA
510-486-6784
EMills@lbl.gov