Swiss Re

Risks & opportunities of climate change for the insurance sector

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Mexico City
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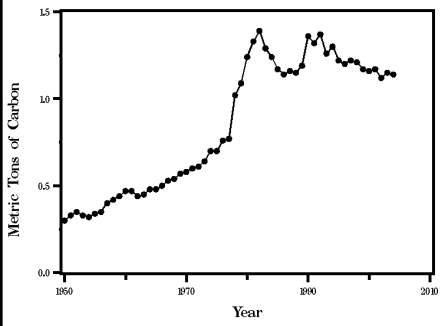
Agenda

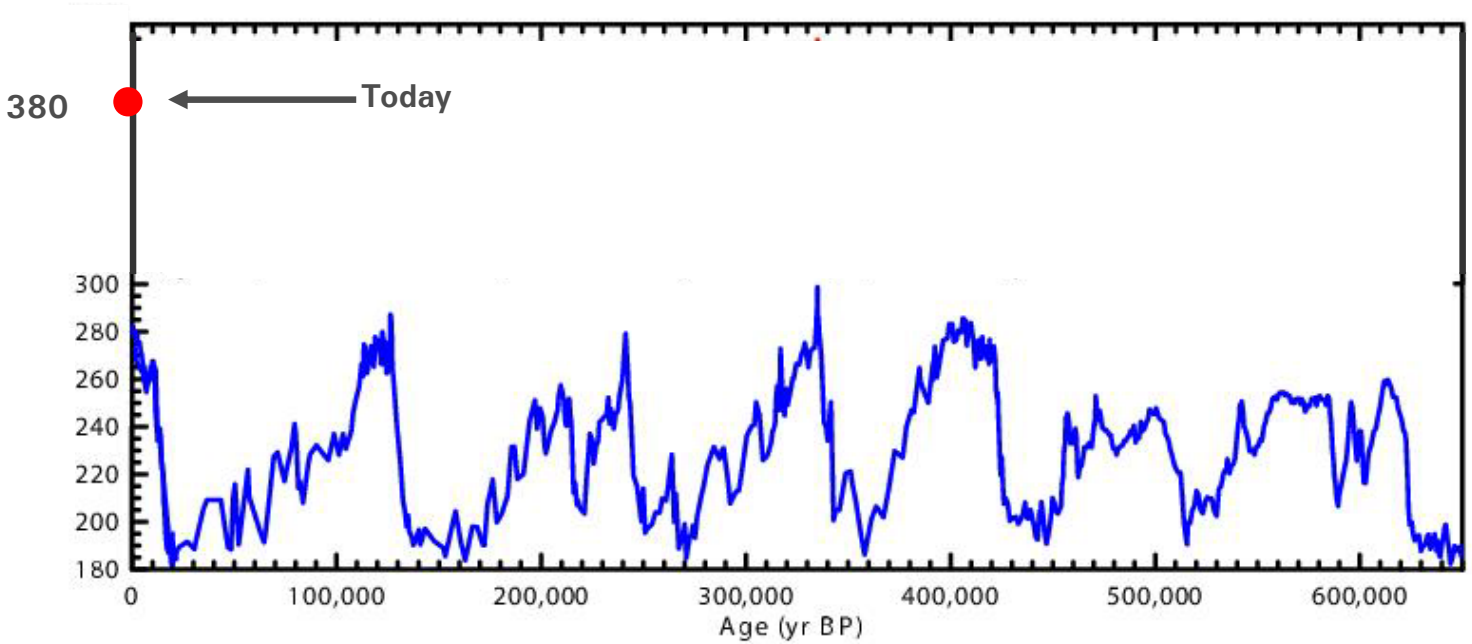
- Science update
- Impact on insurance industry
- Politics & economics
- Opportunities for the insurance industry
- Swiss Re's climate change strategy

Global warming is a fact



Mexico 1950 - 2010

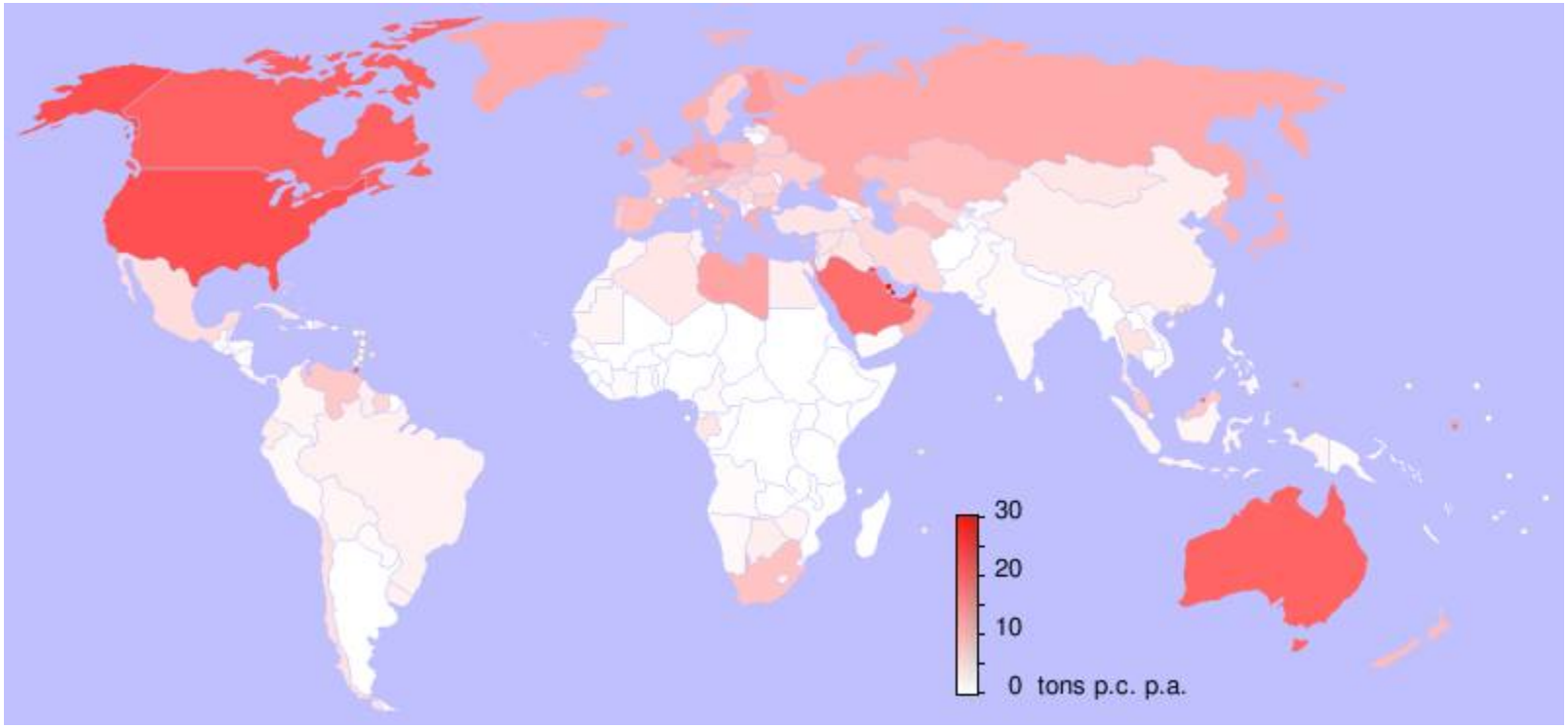
650,000 years of carbon dioxide concentration [ppm CO_2]



Main greenhouse-gas emitters

CO_2 in t / capita (2004)**:**

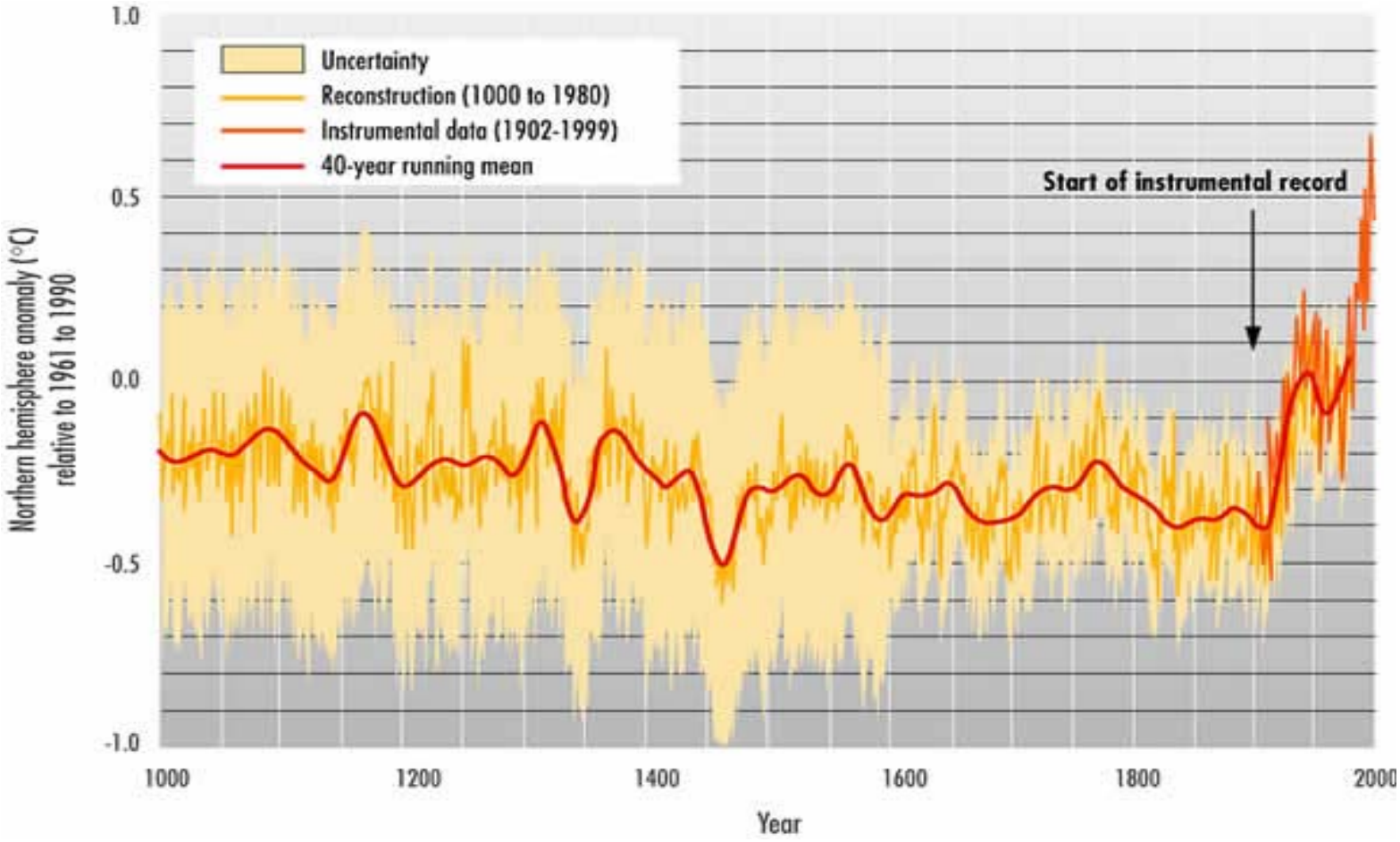
- Qatar: 69.2
- USA: 20.4
- Canada: 20.0
- Australia: 16.3
- United Kingdom: 9.79
- Switzerland: 5.6
- Mexico 4.24



Source: Wikipedia based on data of US Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC) for the United Nations Statistics Division.

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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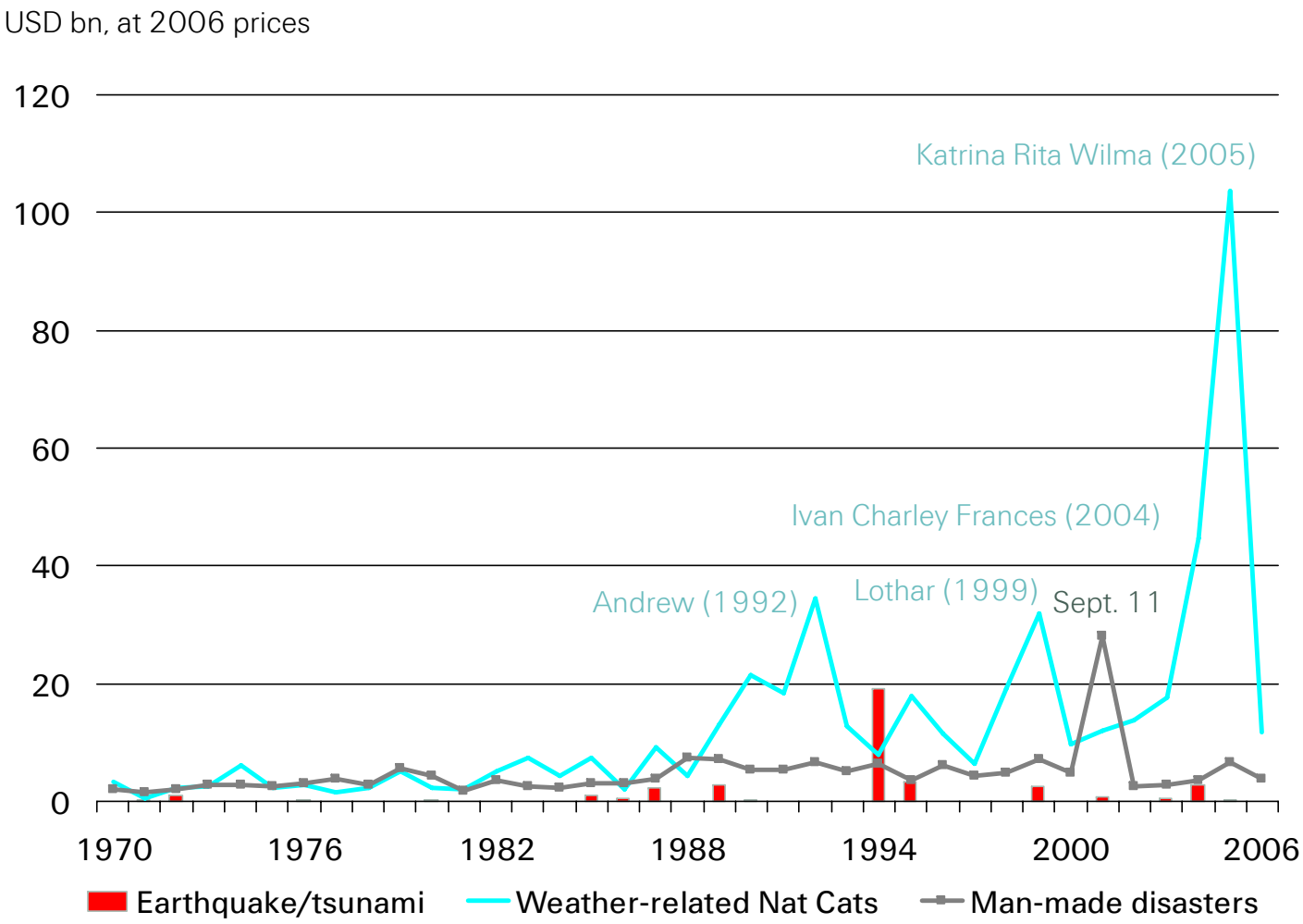
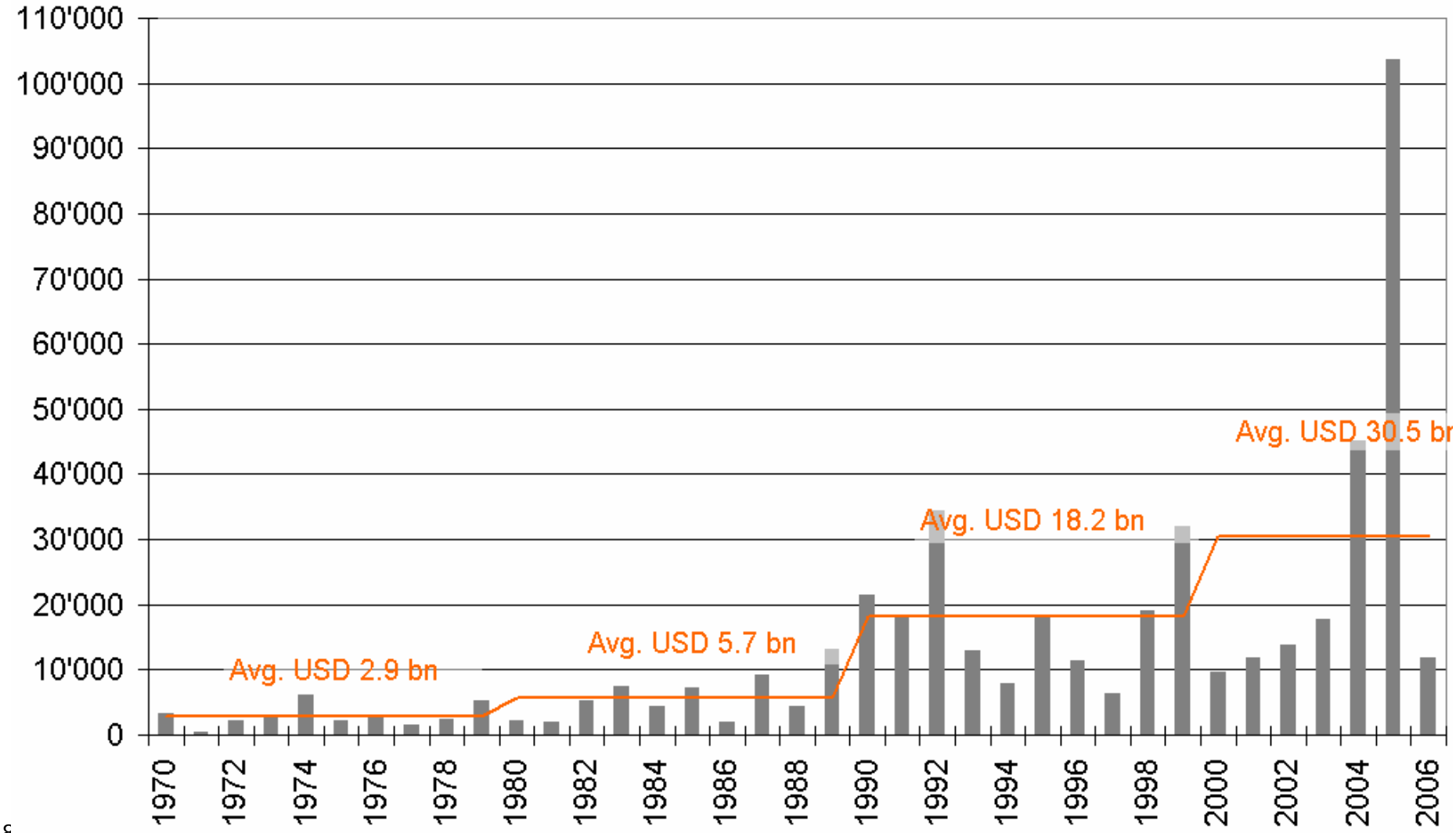
Development of insured losses – 1970–2006:



Note: NFIP flood losses in US included (since 1970). Source: Swiss Re, *sigma* No 2/2007

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

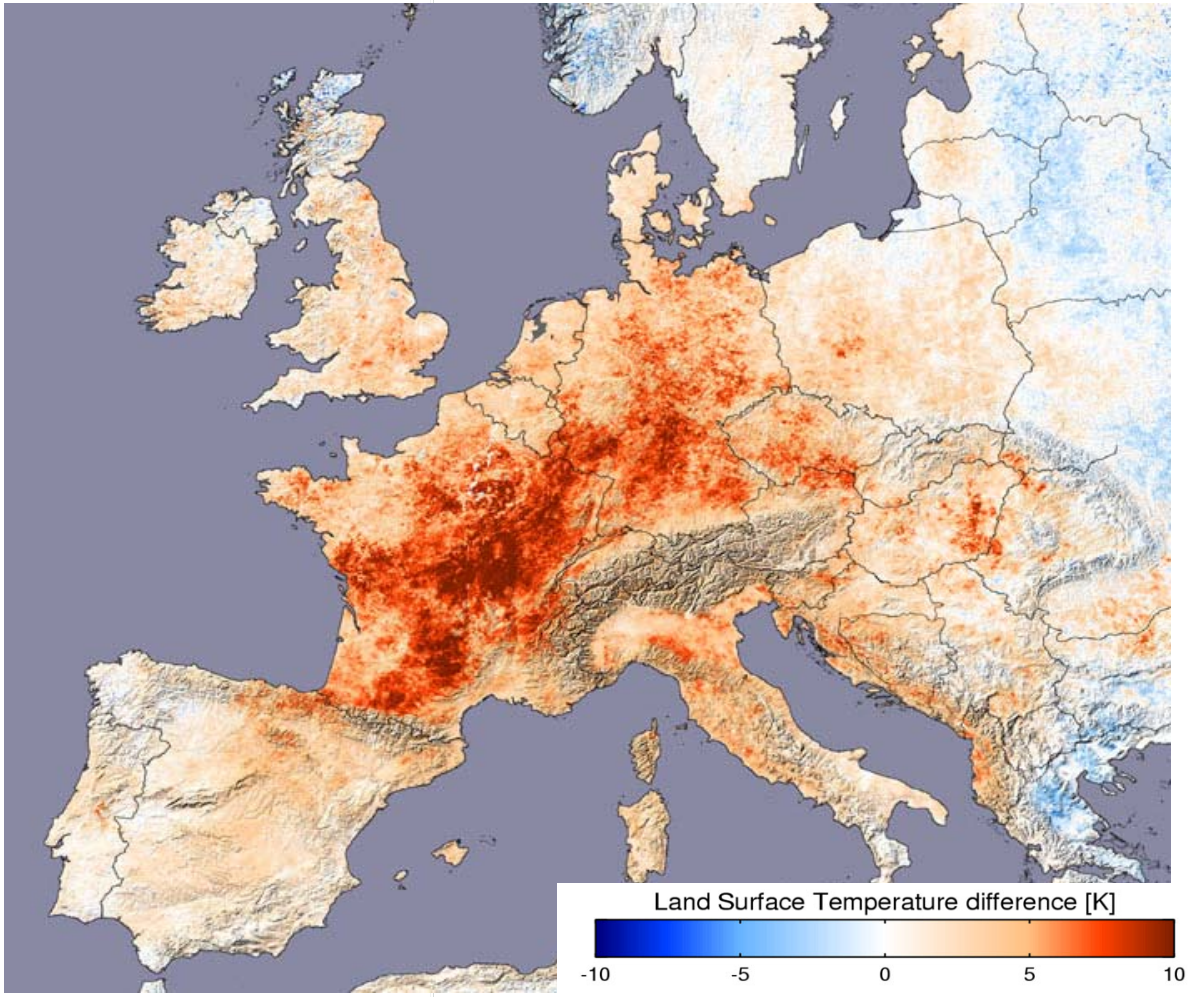
→ Emergency organization

Ocean Drive, FL, 1926.

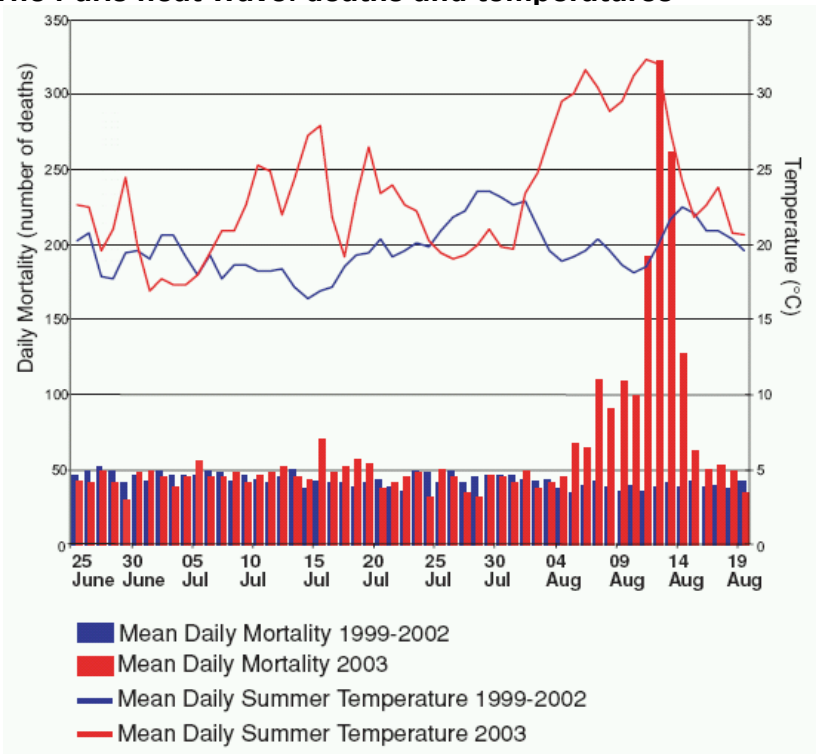
Ocean Drive, FL, 2000

Bahia de Acapulco 2000

Heatwave 2003



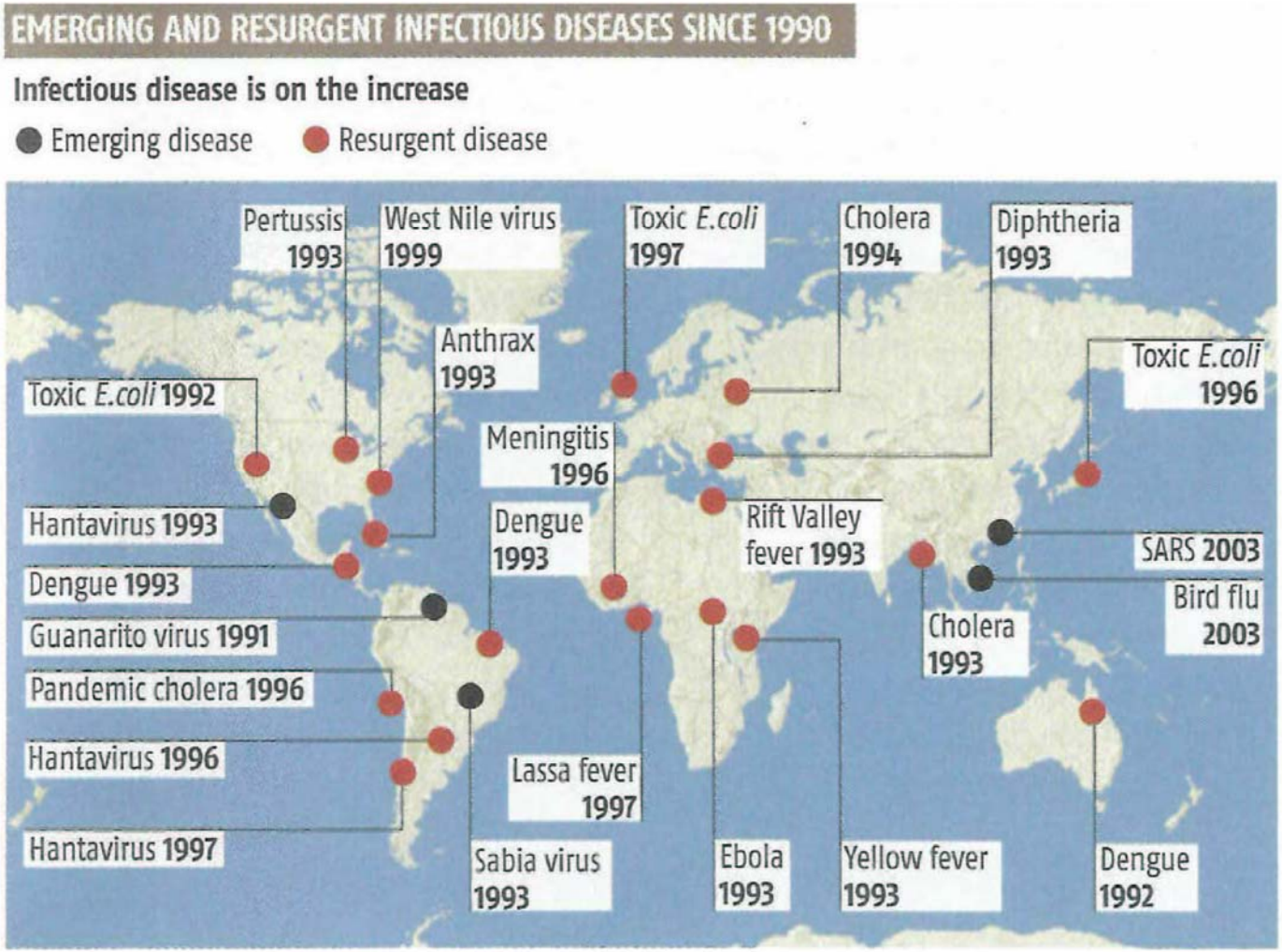
The Paris heat wave: deaths and temperatures



source: ''Climate Change Futures', Harvard Medical School, 2005

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

Changes in the physical environment



Source: New Scientist (June 2004)

Climate litigation

- **Type: <u>Challenge regulatory in/action</u>**

  - 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: <u>Plaintiffs seek relief against emitters of greenhouse gases</u>.**

  Claims are based upon common-law 'public nuisance' theories.
  - 2004 – The State of Connecticut vs. American Electric Power Co.: dismissed

- **Type: <u>Seeking the recovery of damages from existing injury</u>**

  - damage allegedly attributable to the effects of global warming caused by corporations past conduct. Hurricane Katrina-related cases:
  - 2005 - Cox vs. Nationwide Mutual Ins. Co: dismissed
  - 2006 - People of the State of California ex rel. Lockyer vs. General Motors Corp.: pending

- **Type: <u>Lawsuits against corporate directors and officers</u>**

  - 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.

Source: Press release UK Treasury on the publication of the Stern Review on the Economics of Climate, 30 October 2006; http://www.hm-treasury.gov.uk/newsroom_and_speeches/press/2006/press_stern_06.cfm

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Climate change regulative landscape

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

Swiss Re's position

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

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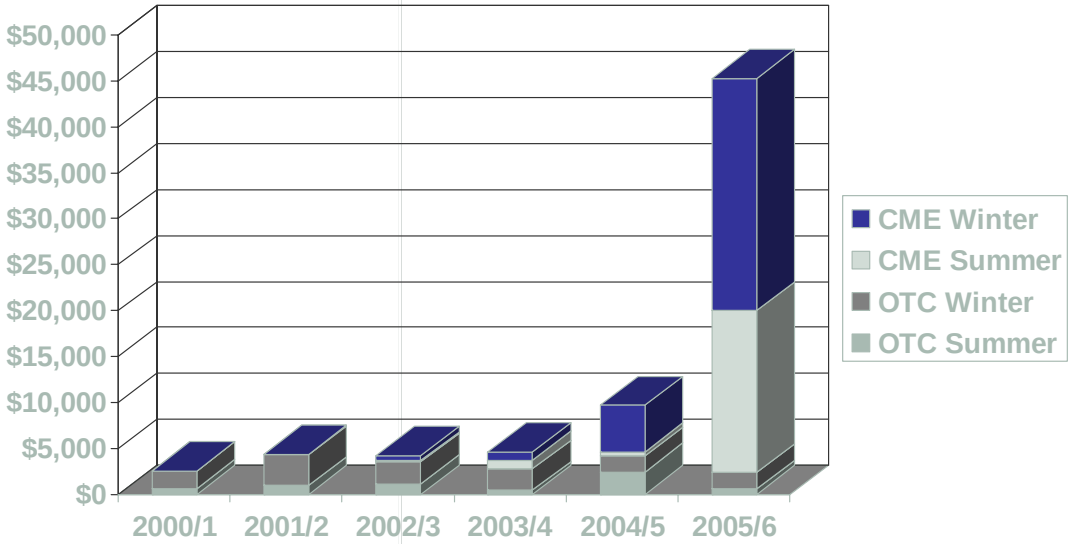
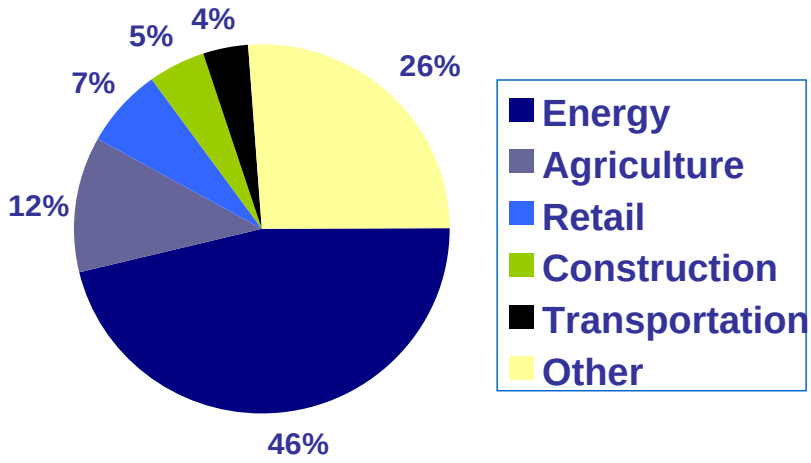
Market growth – notional values (USD m)



Market demand – industry sectors



- 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

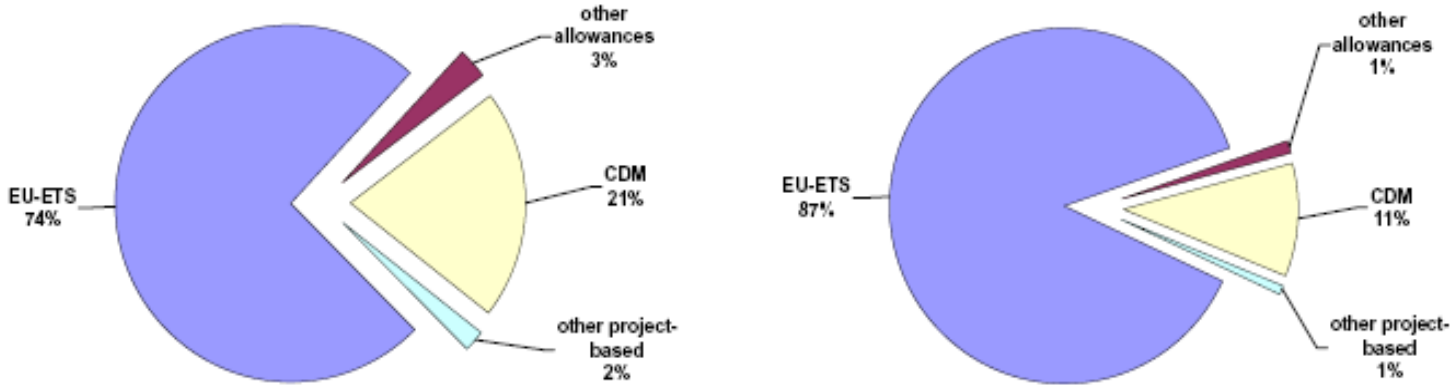
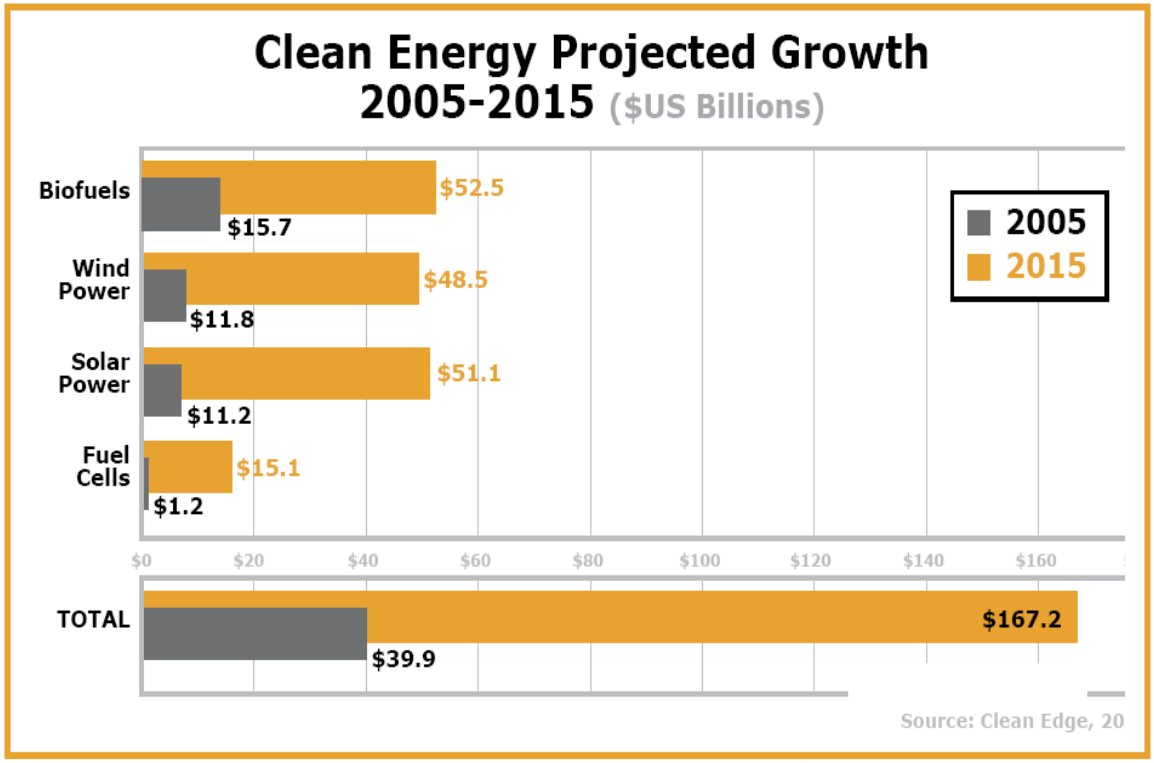


Figure 1: EU-ETS Takes All: Shares of Volume (left) and Value (right) Transacted in the Carbon Market (2006 until September 30)

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



Source: Clean Energy Trends 2006, Clean Edge, March 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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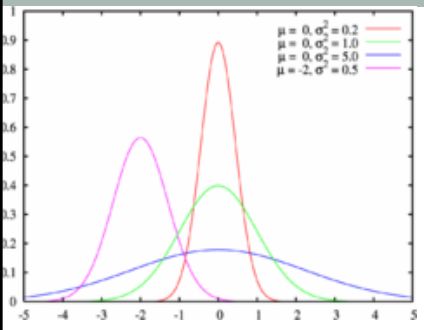
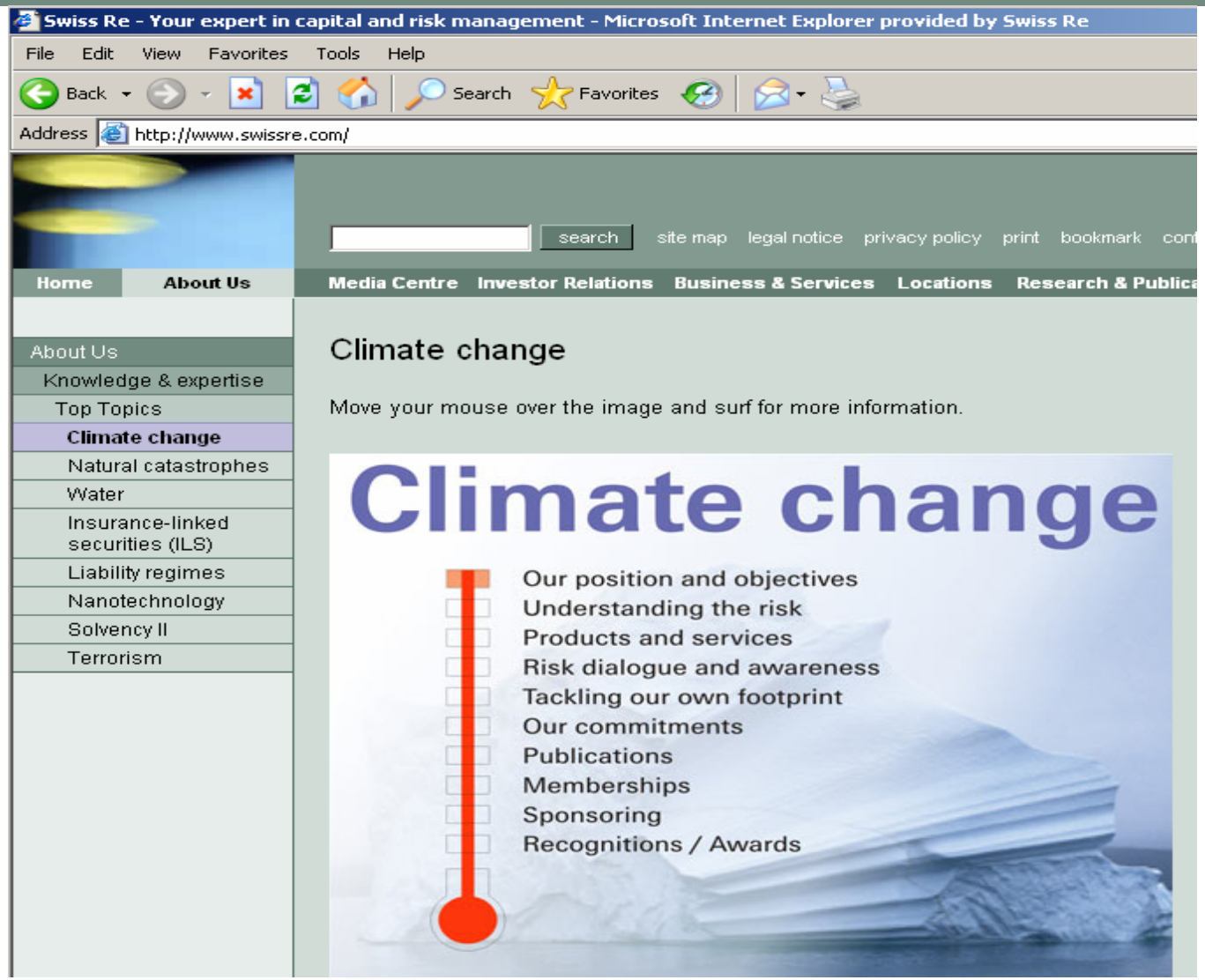


Four strategic priorities:

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



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