

# Background on: Climate change and insurance issues

## Catastrophes

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## The topic

Climate change is a long-term shift in global or regional climate patterns. Often climate change refers specifically to the rise in global temperatures from the mid-20th century to present.

There is consensus among the scientific community that global temperatures are rising, with potential risk to the global economy, ecology, and human health and well-being. However, how much of these changes are due to natural phenomena and how much can be assigned to human activity is a matter of debate. The extent to which weather patterns have already been

affected is also unknown.

As assumers of both property and liability risk, insurers seek to mitigate potential losses every day through a process known as risk management. Regardless of the cause of climate change, the potential of unprecedented losses has led insurers to undertake precautionary actions.

Insurers are redoubling their efforts on the property side to raise awareness of extreme weather events, pointing out how potential damage can be limited through more prudent land use, stronger building codes, and better planning. Some large companies have launched innovative projects to help developing countries adapt, or have invested in renewable energy.

On the liability side, insurers are helping clients focus on risk management related to climate change, including avoiding harm to the environment. Failure to protect against or disclose such harm may lead to lawsuits.

Insurance industry groups are studying the effects of climate change on the industry.

The Geneva Association – whose members represent the world’s largest insurers and reinsurers – conducts research focused on building resilience to extreme weather events and climate risk, as well as the transition to a low-carbon economy. It also facilitates high-level dialogue engaging C-level executives of the insurance industry and authorities from policymakers, standard-setting and regulatory bodies, governments, the United Nations, and development organizations.

## Background: The Science of Global Warming

The burning of fossil fuels, as well as agricultural processes, generate “greenhouse gases” that are emitted into the atmosphere, where they trap heat. This contributes to global warming.

Carbon dioxide – released when oil, coal, or natural gas is burned – garners a great deal of media attention for its role in global warming. While methane is considered a more potent greenhouse gas than CO<sub>2</sub>, there is more CO<sub>2</sub> in the atmosphere. Additionally, methane does not linger as long as CO<sub>2</sub>. Methane is released into the atmosphere both through agriculture and natural gas extraction, processing, and transport, though there are also concerns that methane trapped in Arctic permafrost may be escaping into the atmosphere as the planet warms.

Forests and oceans can absorb some of this carbon. However, to avoid the most catastrophic predictions, researchers believe that carbon emissions must be greatly reduced. Hence, there is a push to reduce overall energy use, boost the use of energy from renewable sources (such as solar heat), and curb the use of paper and other products made from trees, which absorb carbon dioxide in the process of photosynthesis.

Global warming has the potential to affect most segments of the insurance business, including life insurance, particularly if rising temperatures lead to an up-tick in death rates. Property losses

of all kinds are most likely to rise as the frequency and severity of extreme weather events increase, and there is the potential for much higher commercial liability losses if shareholders and consumers try to hold businesses responsible for changes to the environment.

## Insurers' contribution to lowering greenhouse gases

Insurers, like companies in other industries, are promoting strategies to lower greenhouse gas emissions in the hope that if the threats related to global warming are taken seriously, some of society's worst fears will ultimately not occur.

Some insurers have been warning public policy leaders and the general public about the threat of global warming for years. Indeed, insurers were among the first to adopt public statements on the environment and global warming, and to join business coalitions calling on the federal government to enact legislation to reduce greenhouse gases. Companies are establishing more specific units to address concerns and coordinate initiatives on global warming and the environment. Some, particularly reinsurers, are sponsoring research and working with others interested in the same kind of problems, such as finding ways for individuals and society to adapt to extreme weather, particularly in developing countries.

Many insurers are committed to reducing their greenhouse gas emissions and offsetting the remainder through contributions to reforestation and renewable energy projects. They also encourage their employees to adopt "green" policies in their private lives. Some insurers were involved in projects to reduce greenhouse gases even before such efforts gained widespread public attention, and many are now reinforcing their policyholders' desire to reduce their carbon footprints by offering them paperless billing and documentation.

Some have upgraded the quality of their Web sites to encourage policyholders to transact business electronically. (See [Buying Insurance: Evolving Distribution Channels](#).)

Insurers are also working on another front: seeking to reduce the incidence and cost of property damage caused by extreme weather events that still occur, despite society's best efforts to reduce greenhouse gases.

**Property losses:** A great deal remains unknown about the potential impact of global warming on property losses. Most scientists agree that precipitation is becoming more intense and more erratic, leading to hotter, drier environments that raise the risk of wildfires in some regions, as well as damaging rainstorms that increase the risk of flooding in other areas. However, there is less agreement about how the rise in temperatures will affect the number of hurricanes, and when the effect of global warming on storms will be clearly felt. There have been [studies](#) that show that hurricanes are expected to become more intense in the future.

Property losses may include not only claims for structural damage – such as broken windows, a hole in the roof, and the resulting water damage to the inside of the structure and contents – but also for the extra expense of living elsewhere while the home is being repaired or rebuilt. In addition to direct property damage, the commercial side of business must also be considered.

Losses for the commercial side of business may include the policyholder's loss of income and extra expenses during rebuilding or relocation.

**Catastrophes:** [Catastrophes](#) appear to be growing more destructive, but insured losses are also rising because of inflation and increasing development in areas subject to natural disasters.

It is conceivable that in any given year there could be more than one megadisaster. Indeed, after Hurricane Katrina in 2005, rating agencies that evaluate the financial health of property insurers raised the threshold for capital adequacy. They now look at capital adequacy relative to a company's exposure to losses from a 250-year event, rather than a 100-year event, and at potential losses from two megadisasters in quick succession. (A 100-year storm means that each year there is a one in 100, or one percent, chance of such a storm, not that such a storm is only likely to occur once every 100 years. Hurricane Katrina was considered a 400-year storm with a 0.25 percent chance of occurring each year.)

**Managing catastrophe risk:** Developing countries that are vulnerable to extreme weather events will be disproportionately affected if global warming results in more frequent and damaging windstorms, floods, and droughts. These countries generally have fewer resources to devote to mitigation in advance of a catastrophe, fewer resources to promote economic recovery after a catastrophe, and lower insurance penetration rates – the proportion of individuals and businesses with insurance – than in the developed world.

Developing countries have traditionally relied on emergency donations from wealthier countries and aid from international relief organizations. Now, the need to adapt to and mitigate the effects of climate change on a global scale – together with the development of new insurance products, such as microinsurance policies, disaster recovery bonds, and multinational government insurance pools (see reports on [Catastrophes](#) and [Microinsurance](#)) – is leading to new kinds of public/private initiatives to better manage risk. One recent development is insurance-linked securities (ILS). ILS, and particularly catastrophe bonds, are used by insurers to transfer major risks to investors, lowering their reinsurance costs and raising capital. The Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF) utilizes ILS as the first multi-country risk pool, acting as insurer for a large swathe of the Caribbean in the case of a catastrophic weather event.

Another organization active in this sphere is the [Munich Climate Insurance Initiative](#) (MCII), which was launched by insurers, climate research organizations, the World Bank and agencies associated with the United Nations, among others, in response to the growing realization that insurance-related solutions can play a role in adaptation to climate change. Experts in MCII come from the private sector, academia, and nongovernment organizations. The organization aims to create a balance between the emitters of greenhouse gases and developing countries that are immediately and severely confronted by the consequences of climate change. This entails developing insurance programs to help low-income workers deal with disaster-related events, such as a livelihood protection policy that covers the loss of income due to weather-related events, while also helping them mitigate risks by, for example, reducing reliance on a single, disaster-vulnerable crop.

**Liability losses:** Most businesses purchase commercial liability policies to protect themselves from claims of negligence that result in bodily injury, property damage, and personal and advertising injury. Companies may also purchase coverage to protect their directors and officers against charges that they failed to properly manage the company's global warming liability exposures.

Professionals who design the products or projects carried out by a company may be sued for the harm these projects cause. Lawsuits may be filed by shareholders or consumers against a business for actions or inactions that could harm the environment. In addition, shareholder lawsuits may target a company for failure to disclose important information that could materially affect its financial health, and thus influence shareholder investment decisions.

The potential increase in property losses may be relatively small in comparison to what could happen on the liability side. Liability suits could be filed based on legal concepts yet untested, as well as existing ones tailored to "sustainability" cases. Sustainability is broadly defined by the U.S. Green Building Council as "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs." Awards could be substantial because, by their very nature, activities that result in harm to the environment and future generations can impact large numbers of people. Even where lawsuits are not successful, and there is no court award against the defendants, insurers can incur substantial legal costs.

To minimize the likelihood of lawsuits, insurers analyze their policyholders' liability risks and provide guidance as to the best approach, based on their extensive experience insuring businesses in more than a thousand categories. Among the activities reviewed to reduce the risk of global warming lawsuits would be the company's efforts to adapt to global warming to help ensure that they did not cause harm, along with their emissions reduction program and energy conservation projects.

## New products and business opportunities

Without insurance, the economy could not function. Insurers essentially enable new products and services to be created by assuming the risk of loss. Just as insurers quickly adapted existing liability insurance policies for horse-drawn carriages to automobiles toward the end of the nineteenth century, so too are they responding to climate change initiatives at the beginning of the twenty-first century.

First, there are new risks to insure. These include risks related to new industries, such as wind farms and alternative energy facilities. There are also emerging financial risks, such as those involved in carbon trading.

Insurance policies related to carbon trading protect investors in clean technology projects against the failure of the project to deliver the agreed-upon emission rights. Some companies also offer carbon project risk management consulting services. A carbon credit permits the

holder to emit one ton of carbon. Investors in clean technology projects, such as reforestation and renewable energy, buy the rights to credits and sell them in the international carbon trading market.

Among the risks associated with purchasing carbon trading rights is that the technology/project will not meet expectations or that the company will become insolvent before it is able to fulfill its contract, leaving the investor without the necessary carbon offsets.

Second, the need to curb global warming has spurred the creation of insurance policies that provide incentives to policyholders to contribute to these efforts. These include discounts on auto insurance policies for driving fewer miles and policies for green building construction.

**Auto insurance: Pay-As-You-Drive (PAYD)**, also known as usage-based insurance, gives drivers the option of driving less in return for a lower premium. Drivers who participate in PAYD programs are required to either get their odometer checked at the end of the policy period to verify the number of miles driven, to install a special device that transmits mileage to the insurance company or utilize a cell phone for tracking. The latter incorporates telematics, which merges telecommunications and infomatics to track the usage of a vehicle. This device may also be linked to the odometer or be a wireless sensor that can monitor mileage. It is expected that driving less will reduce pollution. Indeed, motor vehicles are responsible for about 25 percent of all U.S. greenhouse gas emissions.

The number of auto insurers offering PAYD options is growing, as is the number of states and cities investigating whether and how to promote their development.

Some insurers also offer usage-based programs with sensors that also provide information on driving behavior, such as speeding and sudden braking.

PAYD programs is an attractive offer for drivers who want more direct control over what they pay for insurance coverage. Though there was some initial concern that drivers would reject these programs because of privacy issues, some observers say that because personal information is increasingly available on the Internet and through social media, privacy may be less of a concern.

**Property insurance: “Green” building insurance coverage:** Homeowners at the leading edge of the environmental sustainability movement are generating their own geothermal, solar, or wind power and selling any surplus energy back to the local power grid. Several insurers are supporting this trend by offering a homeowners policy that covers both the income lost when there is a power outage from a covered peril, and the extra expense to the homeowner of buying electricity from another source. Policies generally cover the cost of getting back online, such as utility charges for inspection and reconnection.

Some insurers offer homeowners insurance policies that allow policyholders to rebuild to environmentally responsible “green” standards in the event of a fire or other disaster, even if they had not originally purchased such a policy. Green standards, which are part of the

sustainability movement, include energy conservation benchmarks and the use of renewable construction materials. The Green Building Council introduced its Leadership in Energy and Environmental Design (LEED) certification program in 2001.

According to Ceres, a climate change research organization, buildings account for more than one-third of greenhouse gas emissions. Ceres also found that green building practices can reduce energy use and emissions by more than 50 percent. With green commercial building construction expected to rise significantly over the next few years, a growing number of insurers are offering green commercial property insurance policies and endorsements, some of which are directed at specific segments of the business community such as manufacturers.

The first green commercial policy was introduced in 2006. The policies generally allow building owners to replace damaged buildings with green alternatives, including energy efficient electrical equipment and interior lighting, water conserving plumbing, and nontoxic and low-odor paints and carpeting. They may also pay for engineering inspections of heating, ventilation, air conditioning systems, building recertification fees, the replacement of vegetative or plant covered roofs and debris recycling. Some building owners cover the income lost and costs incurred when alternative energy generating equipment is damaged.

## Additional Sources

[The Geneva Association, Extreme Weather and Climate Risk](#)

[Actuaries Climate Index](#)

[Munich Climate Insurance Initiative](#)

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