

INSURANCE CONSUMER COUNSEL'S COLUMN

INSURANCE AND CLIMATE CHANGE

BY PROFESSOR GREG MUNRO¹

I. Introduction

It is no overstatement to say that climate change presents a risk of potential collapse of major insurance markets and possibly of the insurance industry itself. Just as empires like the financial industry, auto manufacturing, and airlines have found themselves on the ropes for failure to be able to look around the corner and adapt to change, the conservative and tradition-bound insurance industry is particularly vulnerable to events that are predictable but have not been experienced before. This is because the industry predicts future risk based on what has happened in the past. Climate change on the scale predicted by climate scientists today has never been experienced before. Ironically, climate change can also provide a unique opportunity for the insurance industry to enter new markets, develop new products, and assume major political, economic, and social leadership nationally and internationally to address climate change.

Whether climate change turns out to be risk or opportunity is important to our entire tort system, which depends on the protection provided by insurance. Absent either first-party or third-party insurance coverage, clients rarely receive adequate compensation. Hence, the capacity of climate change to collapse the private insurance markets is also the capacity to collapse the tort system.

This week, the National Academy of Sciences warned that immediate and unprecedented action on global warming is necessary to mitigate the approaching disaster.² The academy called for a tax on carbon emissions, a cap-and-trade system, or other means of stopping runaway climate change. However, while there is broad scientific consensus on the existence and causes of global warming, it is a politically contentious topic. It is still difficult for scientists to predict with any certainty the magnitude of the risks involved

and the timeframe in which those risks will become manifest. As a result, powerful economic interests, such as the fossil fuel industry, are attempting to persuade Americans that global warming does not exist or, if it does, that it is of natural origin and an insignificant risk.

Ultimately, society will look to the insurance industry, arguably the world's experts at assessing and predicting risk, to evaluate the risk of climate disaster, and to develop and market products to protect against catastrophic loss. Ironically, the number and severity of climate extremes and events predicted by scientists who study climate change could force insurers to abandon markets and coverages or face insolvency.

Hence, this article will look at insurance industry awareness of climate change and its implications, what risk it presents to insureds and insurers, what action insurers are taking to address it, and how the insurance industry could be a major

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force in getting the world to address climate change and mitigate its effects.

II. Insurers' awareness of the risk in climate change

Arguably, given that the first Intergovernmental Panel on Climate Change (IPCC) report came out in 1990, the insurance industry has been slow to grasp the implications of climate change and to act to address it. However, by 2004, Swiss Re, one of the largest global reinsurers, warned from Geneva "that the costs of natural disasters, aggravated by global warming, threatened to spiral out of control forcing the human race into a catastrophe of its own making."³ The company predicted that, within ten years, the economic costs of climate disasters would double to \$150 billion a year and noted that the insurers' share of those losses would be the equivalent of a World Trade Center attack annually. (Keep in mind that the insurance industry estimates of losses in the WTC attack were \$35 to \$40 billion, which was purported to be 20 percent of the industry's entire net worth.)

In 2005, Swiss Re issued a report concluding: "Climate change will significantly affect the health of humans and ecosystems and these impacts will have economic consequences."⁴ The company, which had its research done by the Center for Health and the Global Environment at Harvard Medical School and sponsored by the UN Development Program, has been warning about the costs of climate change since at least 2003.⁵ Swiss Re "was behind" the Discovery Channel's documentary series, *The Great Warming*, which appeared globally.⁶ By 2005, both Swiss Re and its major competitor, Munich Re, another of the largest global reinsurers, had material on their web sites about the science of global warming and policy issues arising out of global warming.⁷ As

Swiss Re CEO, John Coomber, says, "Climate change is a phenomenon that is starting to have a major impact on Swiss Re, its partners and clients. The question is no longer whether global warming is happening, but how it will affect our business, as well as our personal lives."⁸ Also, between 2000 and 2005, the Insurance Journal had published over 130 articles on global warming about half of which appeared in 2005.⁹

In 2006, Lloyd's admonished its insurers to start taking global warming more seriously saying that "If we don't take action now to understand the changing nature of our planet we will face extinction."¹⁰ Among Lloyd's warnings are that atmospheric CO₂ levels "are at their highest levels for at least 650,000 years"; that insurers must assess whether the West Antarctic ice sheet could collapse; and that "the 1990s was the warmest decade in a millennium."¹¹ Lloyd's noted "that much of the latest science suggests that climate change will take place faster than we thought."¹² Lloyd's points out that insurers are "major corporate investors" dependent on investment return as part of their revenue.¹³ The company warns, "We expect climate change not only to produce extreme capital damaging events, but also to increase uncertainty around corporate business plans and potentially reduce asset values. This makes it even more important for the industry to price risk according to exposure and to underwrite for profit."¹⁴

Zurich insurance companies set up a climate office in 2008 and set goals to reduce the companies' own carbon emissions by 10 percent by 2013.¹⁵ Zurich's own surveys of its corporate insureds indicate that 79 percent foresaw regulatory risk from carbon emissions in the near future.¹⁶

AIG has adopted a comprehensive program for incorporating climate change considerations across its businesses.¹⁷ The company states:

AIG recognizes the scientific consensus that climate change is a reality and is highly likely in large part the result of human activities that have led to increasing concentration of greenhouse gases in the Earth's atmosphere.¹⁸

Among the company's efforts are: including climate change risks in catastrophe modeling, providing insurance for alternative and renewable energy projects, investing in environmentally friendly companies and projects, establishing an office of Environment and Climate Change, and assessing and addressing the company's own carbon impact from its electrical use and operation of its jet aircraft and motor vehicle fleets.

In 2006, Allianz Group in partnership with the World Wildlife Federation reported on the risk from global warming. The company is seeking new ways to give insureds incentives to reduce emissions and to provide coverage for catastrophes caused by global warming.¹⁹

In 2008, a survey by Ernst and Young of top insurance industry analysts from around the world disclosed that climate change was deemed to be the number one risk facing the industry.²⁰ The chairman of Lloyd's of London also says that climate change is the number one issue for the insurance market.²¹ Hence, in April 2010, climate change was one of the key topics of the World Insurance Forum held in Bermuda,²² and Connecticut hosted the "Connecticut Global Climate Change Summit: Business Risks and Opportunities for Connecticut's Insurance Industry."²³

Ceres, a consortium of investors and companies controlling a reputed \$7 trillion in assets, now issues an annual report of insurer activity in response to the threat of global warming. The Ceres report for 2008 "identifies 643 real-world examples

from 246 insurers, reinsurers, brokers, and insurance organizations from 29 countries – a 50 percent jump in such activity compared to November 2007, when Ceres issued a similar report.”²⁴ Belatedly, the industry today is becoming conscious of the implications of climate change and the grave risk involved.

This is not to suggest that there is major consensus on climate change in the insurance industry; only that some powerful players in the enterprise are taking seriously the risks and opportunities climate change presents to insurers. In the United States, insurers have been much slower to acknowledge and address climate change than in Europe. And, among the companies that are taking it seriously, there is significant disagreement about whether it is a threat to insurers or an opportunity to enter new fields of risk with new products.

When the National Association of Insurance Commissioners (NAIC) proposed a Climate Risk Disclosure Survey of insurers, it met heavy lobbying against it.²⁵ The survey would seek disclosure of the impact climate change would have on operations of the insurers and on their customers. It was deemed necessary to assess the impact of climate change on insurer solvency as well as access to insurance and affordability of the products. The NAIC stood firm and adopted the survey in 2009 for property/casualty and life/health insurers, only to replace it in a surprise move with a “watered down” non-mandatory disclosure survey in March 2010. In spite of such disputes, as Swiss Re’s climate expert, Pamela Heck says, “Climate change is very much in the mind of the insurance industry.”²⁶

III. Risk that climate change presents for the insurance industry

Climate change has serious implications for the insurance industry, which is confronted with actual and predicted large-scale flooding, massive

wildfires, windstorms, class 5 hurricanes, crop damage, earth movement from permafrost melt, subsidence, and sinkholes, mold and moisture damage, and disease and injury to people. Climate change is of particular concern to reinsurers who insure the primary carriers against catastrophic losses too big for the primary carriers to withstand. Reinsurers will take the brunt of climate change disasters. As Swiss Re’s climate expert, Pamela Heck, acknowledges, “Scientists tell us that certain extreme events are going to increase in intensity and frequency in the future.” Keep in mind that 85 percent of insured losses in the property/casualty arena are “coming out of the atmosphere.”²⁷ Moreover, in 2005, 150 year records in the U.S. were broken for number of main storms, number of hurricanes, number of Category 5 storms (three), and number of Category 3 to 5 landfall hurricanes. Remarkably, it appears that a Category 5 storm produces seven times the damage of a Category 3 storm.²⁸

A. The underwriting dilemma in risk from climate change

The big question is whether climate change will be an opportunity for the insurance industry or a threat to it. Weather-related losses in the U.S. since 1971 have been rising much faster than non-weather related losses and are growing faster than premiums, population, or GDP.²⁹ Reportedly, U.S. catastrophe losses have grown ten times faster than premiums.³⁰ As the head of an investment management company that specializes in insurance and reinsurance said, “Climate change is a threat to our business; it’s not something we can safely muddle through. If pricing of existing products can reflect the underlying risk, then climate change is an opportunity – if not, then it’s a threat.”³¹ Swiss Re’s head of sustainability and emerging risks

points out that, while climate change is high on the agenda when the company renews contracts, “Quantitative assessment is utterly difficult, and it will be difficult to put those numbers into models.”³²

One of the underwriting criteria in insurance is that the event insured against must be random. At the same time, the event must occur often enough to allow actuarial predictability. Hence, the exclusions for volcanoes in homeowners’ policies. Also, the underwriter must be able to calculate the magnitude of predicted loss. In 1992, Hurricane Andrew killed 23 people and destroyed thousands of commercial and residential structures in Florida causing a total insured loss of \$15.5 billion. Eleven insurance companies went broke as a result. In 2004, hurricanes in Florida caused \$23 billion in insured losses making it the “most costly year for catastrophes in the history of insurance.”³³ In 2005, however, the estimated private insured losses from Hurricane Katrina were somewhere between \$40 and \$60 billion making it the new costliest natural disaster in U.S. history.³⁴ Total losses from Katrina are expected to be \$200 billion with the government contributing \$100 billion for response and recovery in several states.³⁵

This raises the specter that the insurance industry is not equipped to handle natural disasters on the scale predicted by climate change scientists. The Congressional Reporting Service reports that “the industry simply does not have sufficient capital to fund a mega-catastrophe.”³⁶ The problem is that capitalizing for a mega-catastrophe will result in premiums so high that the private market will collapse. Owners of homes and businesses being rebuilt after Katrina report insurance increases of 200% to 700%.³⁷ Tom Oreck, CEO of the company that builds Oreck vacuum cleaners and has a facility at Long Beach, Mississippi, notes that the

\$1 million increase in premiums his company suffered after Katrina would only buy one-third the coverage the company had prior to Katrina. Immediately after Katrina (and long before Deepwater Horizon), insurers announced 50 percent increases in premiums for offshore oil rigs and platforms.³⁸ After Katrina, businesses report that the increased cost of insurance offsets whatever credits or tax breaks the government gives to reclaim and rebuild property.³⁹

Insurance underwriters need to know the risks inherent in climate change. This is particularly difficult because scientists say that global warming has destabilized the climate systems so that we must expect events or severity of events that we have not experienced before. Hence, the industry is caught between the need to adhere to the logical and time-honored underwriting criteria of looking backward and yet heeding the admonition that it should “move beyond uncertainty” to “incentivize emission reductions and provide coverage.”⁴⁰ Insurers are being pushed to embrace the risk inherent in climate change and market insurance against it.

Insurance companies are supposed to protect insureds against such uncertainty by agreeing to transfer to the insurer the small risk of a catastrophic loss in return for the insured accepting a 100 percent risk of a small loss in the form of a premium. After all, insurance companies

are in the business of assessing risk, and climate change is the biggest risk we face. But what if we are trying to transfer onto the insurer a large risk of a catastrophic loss? Underwriting principles dictate that the insured must then suffer a large risk in the form of a much higher premium. In the alternative, if the percent probability of a given catastrophe becomes too high, like annual wildfires in the same area, the events may no longer be considered “random” so that insuring against them violates underwriting principles.

However, many assert that climate change risk is not certain enough for society and insurers to make the investment in trying to mitigate the effects of global warming. Gene Sperling, who was President Clinton’s top economic adviser, contrasts analyzing the cost of addressing climate change from a conservative investment perspective versus an insurance perspective.⁴¹ He points out that the conservative investor invests new funds only where those funds will bring a higher return than if placed in low risk bonds or money markets. “The skeptic needs a relatively high probability of certainty that climate change can be affected by changes in human activity before he could justify investing resources to address it.”⁴² However, Sperling notes that, if we applied investment perspective to other possible catastrophes in our lives, we would not buy homeowners or life insurance. Do we, at the end

of the year declare our life, auto, and homeowners insurance premiums a bad investment because we weren’t killed in an auto accident after our house burned down?

The Intergovernmental Panel on Climate Change (IPCC), in its fourth report, concludes that there is a 90% chance that climate change is caused by humans, and climate scientists uniformly report a belief that, if humankind reacts quickly, we can forestall some of the worst predicted effects. In light of the magnitude of the catastrophe predicted if we continue business as usual, the investment cost in arresting climate change is a wise investment. Sperling posits that even climate skeptics in Congress could be willing to buy some “Earth insurance” given the risk that the IPCC may be right about what could be the largest catastrophe in human history.⁴³ Insurance for disasters caused by climate change is important because society counts on the financial protection such insurance offers to assure that the community with its social and economic activities will continue. As is being seen in New Orleans, without adequate insurance protection, business and residential activity may cease and the whole community may collapse. For example, if losses to business and residential property in coastal areas become so certain that the private insurance market will not insure them, then development cannot take place in coastal areas, and

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communities cannot be rebuilt after hurricanes or flooding.

B. The risk of litigation liability

Climate change litigation is a major worry for casualty insurers, the chief concern being the liability risk presented by insured corporations that are big carbon emitters. The insurance industry is painfully aware of the history of asbestos litigation in the United States. The big question is, will corporations' contributions to greenhouse gases lead to pollution liability for climate change? It is a sure bet that every climate change case filed now is newsworthy from the insurer's perspective. It appears that about 35 climate change cases have been filed in the U.S.⁴⁴ Among those cases are five of great significance.

In 2007, in *Massachusetts v. Environmental Protection Agency*,⁴⁵ the United States Supreme Court held that carbon dioxide in the atmosphere constitutes a "pollutant" under the Clean Air Act and that the EPA is authorized and required to regulate carbon dioxide and other greenhouse gases under the Act. The ramifications of the holding that emitted carbon dioxide is a pollutant may be enormous for the liability insurance industry.

In *State of Connecticut v. American Electric Power Co. Inc.*, in 2009, the Second Circuit held that private

citizens as well as states had Article III standing to bring public nuisance claims against coal-fired generators.⁴⁶ Specifically, the court held that public nuisance lawsuits brought to address damages from climate change do not present non-justiciable political questions. There, the claims were brought by states and land trusts alleging that six electric generating companies were large contributors to global warming, and their emissions would cause harmful effects to human health. Again, the ramifications of the decision can be great.

In 2009, the Fifth Circuit, in *Comer v. Murphy Oil USA*⁴⁷ overturned a federal district court dismissal for lack of standing where plaintiff citizens alleged that a group of electric power companies had contributed to global warming to the extent they increased the ferocity of Hurricane Katrina causing plaintiffs' damages. However, the Circuit then granted the defendants' motion for rehearing *en banc* creating great interest in the ultimate outcome because of the importance of the decision. In a bizarre decision issued late on Friday afternoon of the recent Memorial Day weekend, the Fifth Circuit said they could not get a quorum of judges and would not hear the case *en banc*. Remarkably, the court then vacated its previous decision granting plaintiffs standing and left in place

the district court's dismissal for lack of standing by reason of political question.⁴⁸ (Legal pundits posit that the Deepwater Horizon disaster has occurred since the Fifth Circuit's original decision making the court wary of the implications of its previous standing decision.)

The Alaskan village of Kivalina sued a group of energy producing corporations, including Exxon Mobil, on claims that those defendants contributed to the global warming that melted the ice barrier that once protected their village from winter wave action.⁴⁹ The village had to move. That suit is now on appeal to the Ninth Circuit having been dismissed as raising a non-justiciable political question.

California sued six leading auto manufacturers on a claim that the autos they manufactured contributed to global warming.⁵⁰ That suit was dismissed and the appeal was filed and then dropped on the belief that the Obama administration would be more friendly to California's need for regulation of emissions. The issue is reportedly arising in another litigation.⁵¹

Insurers likely recall that, in the 40 years after the asbestos defense dam was breached by the first verdict in 1965, hundreds of thousands of liability plaintiffs entered the fray. Further, fortress tobacco, which prided itself on never suffering an

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adverse verdict or settlement, fell under the crushing weight of litigation by 2000. Arguably, big tobacco did not fall because of number or size of verdicts but under the weight of defense costs when multiple states piled on to force the global settlement.

It takes little imagination to picture global warming as the next asbestos litigation especially when there are identifiable deep pocket defendants. The fact is, only fifty power companies are responsible for 75 percent of U.S. emissions from the electrical sector; eighteen for half of the sector's emissions; and six for 25 percent.⁵² Moreover, in *Massachusetts v. EPA*, the United States Supreme Court rejected the argument that plaintiffs could not have standing if the polluters' contribution to global warming was deemed small.⁵³ The Second Circuit also said that plaintiffs can have standing if addressing the injury caused by the defendant would bring the plaintiff "at least some" relief.⁵⁴

For the insurers, there is little solace in the fact that causation in climate change litigation appears to be a major hurdle. As yet, no court has imposed liability on a defendant for damages caused by that defendant's contribution to greenhouse gases. However, the Commercial General Liability (CGL) policies of primary insurers impose a duty to defend, which is often nominally unlimited and is separate and distinct from the duty to indemnify. Hit with lawsuits involving huge damages, the energy and manufacturing corporations can be expected to embroil their liability insurers in coverage litigation and bad faith suits if the insurers balk at the huge defense costs that will be involved.

Insurance coverage issues between asbestos manufacturers and their CGL insurers during the 1980s and 1990s likely predict the future of climate change insurance coverage litigation. The author notes that

*Steadfast Insurance Company v. AES Corporation*⁵⁵ is a declaratory action brought by the insurer of one of the defendants in the *Village of Kivalina* case seeking a court ruling that the CGL policy involved does not cover global warming claims. It may be the first of the climate change insurance coverage cases.

"Reparations" litigation presents another aspect of civil litigation. Reparations theorists posit that the tort system is not equipped to handle the massive number and size of claims arising from climate change but that a viable form of claim will be for reparations for vulnerable populations that are and will be suffering environmental catastrophe by reason of the pollution of the wealthiest countries.⁵⁶ The *Kivalina* case may be an example of such litigation.

C. Risk of liability to the insurers own shareholders and investors

An insurance company and its board of directors have a risk of liability to their shareholders and other investors if they fail to meet the standard of care for protecting against damage and insolvency by reason of climate change. It is reported that in 2006, managers of various pension funds holding \$800 billion in assets wrote a letter to the officers of the major insurers inquiring "about the nature of their financial exposure due to climate change and what they're doing about it."⁵⁷ The California State Teachers Retirement System (CalSTRS) is the largest teachers' retirement system in the world with \$135 billion in assets.⁵⁸ It has \$1.3 billion invested with eight American insurers including AIG, Hartford, and Prudential. CalSTRS's CEO is the former insurance commissioner for the State of Colorado. CalSTRS exercises its fiduciary duty to its teachers by demanding accountability from the insurers as to their vulnerability to climate change impact and what they are doing. They have

joined with other institutional investors holding \$3 trillion in total assets to force regulators and insurers to make such disclosures.

Such pressure from investors is a stark reminder to insurers that forward-looking institutional investors do not intend to be left holding the bag when a negligent insurer fails to recognize and address the risk that climate change presents to the solvency of the company. Insurance companies walk a tight rope when disclosing contingent liabilities to their auditors and regulators in the process of developing their financial statements which will be the subject of investor reliance. An insurer which, in the face of investor inquiry, fails to make an appropriate analysis and disclosure of potential impact of climate change on the insurer's solvency may be the subject of investor suits later.

D. Defenses to insurance coverage in climate change litigation

In climate change litigation to date, the courts have not ruled on any defenses to insurance coverage litigation.⁵⁹ However, the three defenses raised in the coverage litigation in *Steadfast Insurance Company v. AES* will sound familiar to anyone who has been involved in asbestos litigation: First, the insurers argue there has been no covered "occurrence" which is generally defined as an accident. We can expect that insurers in climate coverage litigation will contend that corporate carbon emitters discharged carbon into the atmosphere on a daily basis as part of the business, so that there was no "accident" or "occurrence."

Second, the insurers argued that, because the greenhouse gases had been building since before the policy was issued, the coverage is blocked by the "loss in progress" endorsement or the "known loss" defense. Insurers will contend that the carbon emitting insureds knew

of the dangers and their potential liability by at least 1990 when the IPCC report first came out. However, when asbestos defendant, National Gypsum Corporation was besieged by over 100,000 lawsuits from 1972 into the 1990s, the Second Circuit in 1995 rejected the insurer's "expected or intended defense" and the "known loss" defense. The court stated that "NGC was fully entitled to replace the uncertainty of its exposure with the precision of insurance premiums and leave it to the insurer's underwriters to determine the appropriate premiums."⁶⁰

Third, insurers defend by asserting that the greenhouse gas claims are blocked under the CGL pollution exclusion. The "absolute pollution exclusion (f)" under the post-1985 CGL form or the "standard pollution exclusion" in the 1970 form may apply, but each of the exclusions have been the subject of substantial court limitations in their application as will be discussed below.

E. Coverages that will be implicated in covering the risks

The predicted impacts of global warming are so broad that policies in the health/life field as well as property/casualty will be implicated. As the Government Accountability Office points out, "Virtually anything that is insured – property, crops, and livestock, business operations, or

human life and health – is vulnerable to weather-related events."⁶¹


1. CGL policies

Lloyd's says: "We foresee an increasing possibility of attributing weather losses to manmade factors, with courts seeking to assign liability and compensation for claims of damage."⁶² Obviously, defendants sued for liability for causing global warming, or failing to address or mitigate it, will invoke coverage under their CGL policies. Whether coverage will apply depends on which era of policy forms is invoked. Companies such as coal-fired generators or auto manufacturers, which have been sued for emitting carbon for many decades, will likely demand defense and indemnity from all of their CGL carriers that provided coverage at least back to the 1960s.

CGL policies have generally been "occurrence" policies, which, since 1966, have covered an "occurrence" defined as "an accident, including continuous or repeated exposure to the same general harmful conditions."⁶³ Many major carbon emitters have been adding to the accumulated atmospheric carbon buildup for decades. The pre-1966 policies covered an "accident" and excluded "expected or intended" damages. However, the courts tended to consider gradual pollution an accident and granted coverage under pre-1966 policies. They did so even if the defendant expected and intended the discharge, as long as it did not expect the ultimate injury. Many carbon polluters will assert that they did not know of the danger from their carbon discharges until at least 1990.

In 1970, the Insurance Services Office (ISO), the trade organization for the property/casualty insurance industry, adopted into the CGL policy forms the first pollution exclusion, known as the "standard" pollution exclusion, which barred coverage for pollution except where the discharge of pollution was sudden or accidental. However, courts immediately split over whether "sudden" has a temporal aspect requiring an abrupt event or whether it simply means "unexpected," so that gradual pollution would be covered. Many courts found coverage for gradual discharge of pollution under the standard pollution exclusion.

Since 1985/86, the standard ISO form CGL policies have included the "absolute" pollution exclusion (f) under which the industry intended to block all pollution coverage. Whether increased levels of naturally occurring greenhouse gases constitutes "pollution" will be an immediate coverage issue in climate change litigation. However, recall that the United States Supreme Court in *Massachusetts v. Environmental Protection Agency* held that carbon dioxide is a "pollutant" under the Clean Air Act.⁶⁴ Subsequently, the EPA issued an "endangerment finding."⁶⁵



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It is clear that climate change litigation against corporations deemed to have caused global warming will involve the CGL carriers that provided coverage for the last fifty or sixty years. Hence, the insurers will be confronted with coverage litigation, disputes over duties to defend, and substantial risks of large scale indemnification. Issues of allocation of responsibility between carriers for successive years, allocation between multiple sources, allocation between primary and excess carriers, "known loss" defenses, and causation, all familiar to asbestos litigants, will appear front-and-center in climate change litigation.

2. Directors and officers policies

Climate change litigation will likely involve corporations and government entities that have not been polluters but breached duties to address global warming or to mitigate its effects. The board of directors of a corporation or insurer rendered insolvent for failing to appreciate and mitigate the impacts of climate change on its business may be the target of investors who have suffered losses. Such claims will invoke Directors and Officers (D&O) coverage and will be in the nature of negligence claims against the directors and officers and not pollution claims. Hence, the pollution exclusion is unlikely to provide the insurers any defense. Again, if one looks at the savings and loan litigation of the 1980s and the asbestos litigation of the last thirty years, one can see where the search for adequate compensation has lead plaintiffs' lawyers to the D&O coverage by means of tort litigation against the corporate directors and officers.

3. Homeowner's policies

Arguably, homeowners' policies are already in the forefront in providing indemnity for climate change. The massive increase in residential

fire claims in the suburban/wild lands interface is thought to be the result of arid hot conditions brought on by climate change coupled with increasing homeowners' expansion into those areas. The predictions that climate change is and will be destabilizing the climate system to cause extremes of hurricanes, tornadoes, thunderstorms, wildfires, winter storms, high wind, hail, snow, and rain means that homeowners insurance carriers are and will be heavily impacted. As an official of large global reinsurer, Aon Re Australia, reports, "The most obvious impact of climate change on the insurance sector will be the increase in insured property losses from extreme weather events."⁶⁶

As indicated above, the Harvard/Swiss Re study predicts that increased mold will be a result of increased CO₂ in the atmosphere. Most trial lawyers know from experience that mold in residences is a risk from which the insurance industry has fled, and no public program is available.

Flood insurance for the most part is already considered too risky to be entirely provided by the private market. Accordingly, The National Flood Insurance Program (NFIP) provides coverage for home and business owners on the coasts, river shores, and islands of the United States in communities that have entered an agreement with the federal government and control flood plain development through zoning. NFIP's exposure was \$1 trillion in 2005 having quadrupled since 1980.⁶⁷

Under the NFIP program, private insurers participate in a market in which premiums are uniform and are subsidized. NFIP insurance covers all the mechanical workings of the home but not the exterior or the contents. Homeowners must seek a contents rider from the private insurance market.⁶⁸ Whether the private homeowners insurance market can, without government collaboration

even continue to provide homeowners coverage on the Atlantic and Gulf coasts may become an issue.

The problem for public insurance programs like NFIP and the Federal Crop Insurance Corporation (FCIC) is that their goals are fundamentally different from private insurers, which emphasize the financial success of their business operations.⁶⁹ The public programs focus on affordability of insurance and broad participation by those at risk.⁷⁰ As extreme weather events cause more and more disasters and the private market abandons the higher risks, the fast growing exposure of the public insurance programs will be a threat to the national budget. Congress had to increase NFIP's borrowing authority from \$1.5 billion to \$20.8 billion as a result of the hurricane losses of 2005 alone.⁷¹

4. Auto policies

The comprehensive coverage on the auto policies will be implicated by the same extreme elements that will damage and destroy homes. Climate change will impact automobiles, trucks, recreational vehicles, and other motor vehicles. One need only consider the massive number of trucks, cars, motor homes, and motorcycles destroyed or damaged in Hurricane Katrina to illustrate the risk for auto insurers.

5. Health and life policies

In November of 2005, The Harvard Medical School/Swiss Re report warned of climate change effects on human health and on ecosystems.⁷² The report identified several threats to human health including heat stress. We should note that the heat wave that killed as many as 50,000 people in Europe in the summer of 2003 was a one-in-46,000-year event placing it so far outside the norm that it is almost impossible to consider it a natural deviation.⁷³ The Harvard/Swiss Re

report identified respiratory disease as an impact of climate change noting that a doubling of CO₂ is predicted to result in a 60 percent increase in pollen, an increase in molds, as well as an increase in smoke and particulate from wildfires and from burning of fossil fuels.

Unsafe drinking water and food poisoning were also identified as threats from climate change. Infectious diseases such as malaria, West Nile virus, and Lyme disease were predicted to increase with global warming. The report predicted injuries from natural disasters and environmental contamination by mercury and other materials.⁷⁴

Health and life insurance policies are the methods by which individuals seek to protect themselves against all risks to the human body. The health insurance industry is already struggling with the severe strain imposed by an aging population in addition to health problems from unappreciated risks involved with modern diet, habits, and exposures to chemicals. Whether the industry can withstand the additional

burden arising from health problems resulting from climate change remains to be seen. Judging from the political events of the past couple of years, the health insurance market is moving much closer to collapse due to its cost without any catastrophic losses associated with climate change. Should climate change further increase the burden on the health insurance industry to pay claims or reduce coverages, policy-makers may be forced to act in favor of replacing private health insurance with public health insurance.

The decision on the part of the consumer to purchase life insurance, on the other hand, is not a matter of necessity like health insurance. However, given that global warming is likely to affect the health of human beings in a negative way, it is safe to assume that unexpected and early deaths are also likely to affect the life expectancy tables negatively. While claims may increase, it is hard to imagine a scenario where a life insurer might be declared insolvent from claims with the catastrophic risk spread as widely as it is. On the market side of the equation, any change in life expectancy that trends toward earlier death will result in higher premiums for life insurance. Since life insurance is almost always a discretionary purchase, one can envision that global warming will likely cause life insurance policies to become more expensive, and thus available to fewer consumers.

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6. Crop insurance

The crop insurance market also is an example of an insurance market that depends on government/insurer collaboration because the risk is too high for a straight private market. Since 1980, program expansion of the Federal Crop Insurance Corporation has increased exposure 26 times to \$44 billion.⁷⁵ The FCIC insures crops against drought and other weather disasters. Multi-risk crop policies will be a particularly risky product for insurers to offer if climate change results in the predicted extreme weather events in the nature of early and late winter storms, hail storms, hail, high winds, drought, and insect and disease infestations.

These are some of the insurance coverages that will likely be invoked in dealing with the effects of climate change. Other policy lines may be implicated because the impacts of climate change appear so broad.

III. The role of insurers in dealing with climate change

In the United States, annual expenditures for private insurance are near \$1.5 trillion and expenditures for social or public insurance \$1 trillion.⁷⁶ The

industry has remarkable power due to the sheer magnitude of the insurance enterprise in the U.S. coupled with the fact that its products are necessities of life in any developed country. Moreover, powerful insurers and reinsurers in the industry can provoke industry-wide change in products offered in a way that other enterprises could not.⁷⁷ What insurers are doing in the face of climate change, though impressive, pales when one considers their potential as leaders in this crisis. Nevertheless, here are some of the ways that the industry is reacting to climate change:

A. Increasing scientific study of the risk involved

As Lloyd's has pointed out, the industry cannot survive by basing global warming risk decisions on historical patterns but must take a new underwriting approach by looking forward.⁷⁸ This means that the industry will have to focus on the latest science and computer modeling to assess risk of an event that has not been experienced before. For example, Lloyd's predicts the industry will have to plan for extreme wind events occurring over longer seasons and wider geographic areas.⁷⁹ Such underwriting is not based on traditional method of accounting for historical events. Lloyd's calls for "business-focused scientific research" in order to "convert scientific predictions into practical guidance for the industry."⁸⁰

B. Marketing innovative insurance products

In 2008, Zurich and Liberty Mutual began offering boards of corporate directors insurance protecting against climate change litigation; a harbinger of what may be looming for corporate carbon emitters.⁸¹ Insurers are now offering coverage for those who develop carbon sequestration storage projects.⁸² In their marketing, insurers must go back to

risk-based pricing. In the past, they have neglected that principle, concentrating instead on acquiring as much business as possible because premium dollars could be invested in the capital markets.⁸³

C. Offering insureds incentives for reducing carbon footprint

Insurers will offer incentives to their insureds to reduce their clients' risk of incurring damage from climate change and of causing damage to others by contributing to greenhouse gases. Travelers Insurance Company is offering premium deductions for people driving hybrid vehicles.⁸⁴ The company offered the incentive when a senior vice president researched the number of hybrids and the customer profile of the owners and found that they were "a preferred customer – middle aged, very responsible, and stable financially."⁸⁵ Hybrid car sales have grown by 50 percent per year to 350,000 in 2008 providing a growing market.⁸⁶ This incentive to cut greenhouse gas emissions is being offered by other insurers, because their studies show that hybrid owners tend to be lower risk drivers in any event.

Ceres reports that, in 2008, two dozen auto insurers offer pay-as-you-drive policies with discounts up to 60 percent for those driving less than the average driver.⁸⁷ Again, this incentive has financial benefits for the auto insurer because there is a direct correlation between miles driven and risk of accidents.

By 2008, at least 22 companies collectively offered 39 policy endorsements, extensions, or services for "Green Buildings."⁸⁸ Fireman's Fund currently offers optional coverage allowing for repair of building damage with "greener" materials and appliances that meet EPA Energy Star ratings.⁸⁹ In cases of total loss the building must be rebuilt as a "green" building. Fireman's Fund's reasoning is that energy efficient buildings have greater asset value.

Willis Holdings of London, AXA, and Tokio Marine & Nichido now offer products to protect against risk in wind power projects; Munich Re and AXA for risks in solar photovoltaic projects; and AXA and Munich Re for risks in exploration and drilling in geothermal projects.⁹⁰

D. Using insurer investment to promote climate mitigation

The insurance industry had reported assets of \$16.6 trillion in 2005.⁹¹ Ceres reports that, in 2008, 15 of the lead insurers had made "climate friendly" investments of \$11 billion, which it acknowledges is a "vanishingly small" part of its investment portfolios.⁹² Prudential has invested \$500 million in wind energy production.⁹³ As of 2006, Swiss Re had invested \$320 million in alternative energy, water and waste management, and recycling.⁹⁴ Swiss Re is investing in solar technology.⁹⁵ Peter Hoeppe, head of the corporate climate center at Munich Reinsurance Company said, "The insurance industry is one of the largest investors in the world" and notes that "more and more investment opportunities are in new technologies" that reduce carbon emissions.⁹⁶

E. Acting as leaders in promoting climate mitigation

Christopher T. Walker, Swiss Re's managing director of its Greenhouse Gas Risk Solution, Financial Services Business Group, told members of the U.S. House and Senate:⁹⁷

The reality here is simple: insurance and reinsurance companies have the potential to become prime catalysts for the development of renewables, emission reduction, and energy-efficient technologies for two reasons: such steps will reduce risks and open up new and lucrative lines of business activity.

Lloyd's foresees that the insurers will educate the public about the risks involved in global warming.⁹⁸ Companies are already educating their insureds in risks involved in climate change. For example, Marsh and Yale University train customer boards of directors in the risk of climate change.⁹⁹ The financial incentive for the insurers is that they are insuring the boards of directors of corporations who may face liability for global warming caused by their corporations.¹⁰⁰

In the circumstances, Lloyd's foresees the necessity for "meaningful partnership" between government and insurers to deal with situations in which "long term-insurability of weather-related risk" is imperiled or climate change advances faster than expected.¹⁰¹ What this means is that government may have to assume the worst risks with public insurance programs or take such actions as zoning business and residential structures away from known flooding areas, in particular ocean beach areas.

F. Reducing insurer's own carbon footprint

Ceres reports that "seventeen insurers and reinsurers and six brokers have achieved carbon neutrality."¹⁰² Because there is no standard reporting instrument, it is hard to know how much effort insurers are putting into reducing their own carbon footprint. However, Ceres cites many examples, among them Sombo Japan Insurance Company which has had, since 1992, an in-house energy management program that now covers 350 buildings and has provided "corporate social responsibility training" to 15,000 employees resulting in

a 22 percent reduction in carbon dioxide emissions from 2002-2004.¹⁰³

XI. Conclusion

Some of the effects of climate change can be mitigated if society takes action immediately. However, no matter how fast we act, weather extremes caused by destabilization of our life systems on land, in the atmosphere and in the oceans will likely result in natural disasters against which we will need to protect ourselves from financial ruin.

The insurers will bear the brunt of the global warming catastrophes. As Ceres points out, "Insurers have more incentive than any other industry to catalyze global action on climate change."¹⁰⁴ Insurers are taking a serious interest in global warming, its causes, and the necessity to address it. They realize that climate risk can be exacerbated by human activities and are making efforts to quantify and reduce the risk involved. From a risk perspective, they have nothing to lose in encouraging mitigation. Because they are huge and powerful investors, they have the power not only to influence the corporations, institutions, and families they insure through negative and positive insurance incentives, but also to influence government to take a major role in addressing climate change.

If the industry cannot effectively calculate the risk involved in the effects of global warming, it will not insure the events, and the risk will either be born by public programs or by the individuals, families, business entities and institutions that suffer the losses. If the industry does not exercise the leadership, expertise and influence it has to understand the

risk, insure its own solvency, and provide the insurance products needed to cope with climate change, the entire private market could collapse. At a time when political leaders lack the courage and skills necessary to cope with the looming crisis of climate change, insurers have the power and potential to act for the greatest good of all of society by leading in climate defense. If they do not assume this mantle, their failure may lead to the demise of a good deal of the private insurance market and the lifeboats that society needs to continue its enterprises. At that point, government will be called upon to be insurers of last resort. Judging from the turmoil in the global markets currently, very few if any governments in the world can realistically absorb such insurance obligations on a sound fiscal basis. Never has the insurance industry been in a position to play a more pivotal role in world and national affairs.

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"Representative government and trial by jury are the heart and lungs of liberty. Without them we have no other fortification against being ridden like horses, fleeced like sheep, worked like cattle, and fed and clothed like swine and hounds."

~ John Adams

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