

Part IV

Unique Perspectives on Emerging Issues and Opportunities

Insuring the Future in a Changing World: The Impact of Climate Change on Insurance and Financial Products and Services

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at Yale

Chapter 11

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EDITORS' REMARKS

During the Philanthropy Panel discussion, Michael Northrop commented that it is surprising “how little direct intervention there is in the policy debate [concerning climate change] by insurance companies.” This is not the first time we have heard such a sentiment, and it indeed seems to follow that the insurance industry – given its natural positioning as both insurer and investor with respect to many of the challenges posed by climate change – would be a major participant in such dialogues. In this chapter, Ralph Mucerino, representing the largest commercial insurance company in the world, operating with about \$1 trillion worth of assets, addresses the link between the insurance industry and climate change “within the context of AIG’s business.” He does so in a way that is both substantively and anecdotally interesting, as one might expect from a well-traveled “insurance journeyman” with a long and illustrious career in the insurance industry who underwent a “personal epiphany” on climate change a few years ago.

The chapter is organized by sector, moving through renewable and alternative energies, coal and minerals, oil and natural gas, chemicals, paper and forestry products, and insurance products and services. The driving interest within each of these sectors is risk management and opportunity. With respect to biofuels, for example, “All of these technologies, whatever they may or will be, have been or will be insured for property and liability insurance, as well as environmental insurance. We will [also] invest in these technologies from both an equity and debt perspective.” The subsequent sections on sustainability initiatives and environmental investments are, again, mostly within the context of AIG’s business but not exclusive of more general principles. The conversation regarding sustainability, for instance, carries into the final section of the talk where we are reminded of the underlying human element of business: “We each have the ability to influence what companies do because we manage the company.”

The question and answer session largely focuses on insurance in carbon markets, catastrophe risk, and the role and ability of insurance companies to conduct business under uncertainty. The conversation ends with some examples about catastrophe management capability, supporting the claim that, up to a level, anticipatory measures can be less costly than responsive ones.*

* To gain further context, read related articles, order a bound copy of this publication, or download pdfs of the publication or the recorded version of this presentation, please visit: www.yale.edu/cbey/carbonfinance2008

INTRODUCTION

I really enjoy participating in these types of presentations because it allows me to grow, understand, and learn more about what is going on in the world around me and within the halls of academia. I'm not a scientist. I'm what you could call an insurance journeyman. I've been in the insurance industry for a long time and it is something that I have made a career out of.

About two or three years ago, I underwent a personal epiphany on climate change. Certainly, being in the insurance industry, I was aware of pollution and the environment because these are things that we insure on a daily basis. From the standpoint of having a clear intellectual understanding of climate change, I am not an expert, but I am somebody who has spent a lot of time looking at climate change within the context of AIG's business, as a citizen of the United States and the world, and certainly as a parent.

It is clear to me that something is happening. When you look at the debates that have gone on for a long time, you have some people looking for unequivocal proof that climate change is there and is man-made. I don't know how many things in life are really unequivocal. Maybe the love of your dog is unequivocal.

When we look at the issue, we hear two simple words – climate change. When I think of the thousands of issues that are associated with climate change and the number of people that will put themselves forth as experts in climate change and say, "Here is the answer," the one thing I have learned over the past couple of years is that there is not one answer. It starts with turning the lights off when you leave a room and builds from there.

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CONTEXT

Let me give you a little background about AIG before we begin the presentation. AIG is a company that operates globally. We were founded in Shanghai about 85 years ago by an American man named C.V. Starr. C.V. worked for an insurance agency in Shanghai before moving west to start AIG. AIG operates in over 100 countries and is the largest commercial insurance company in the world. For those of you that read the business pages, you will know that we have received some unfavorable notoriety over the past few years, which hasn't been all that good, but I believe that we are a great company that does good things.

We operate with about \$1 trillion worth of assets, \$800 billion of which we manage as part of an overall investment portfolio. We invest about \$60 billion a year in

different initiatives focused on our insurance portfolio business. We have undertaken new business initiatives in China and India. We were one of the first companies into China through an effort of our former Chairman, Hank Greenberg, who spent nearly 25 years building the Chinese franchise. We have also established operations in India in partnership with the Tata Group, which as you know is an industrial titan. AIG is a global company and therefore we see issues on a global basis. We do not sit here in our U.S. offices and look outward to try and figure out what's going on in the rest of the world – we are a part of that world.

In my own career at AIG, I have had the good fortune of traveling through Asia, including Japan, Korea, China, Pakistan, India, and in Africa to places like Kenya, Zimbabwe, and Egypt, as well as Israel, and in Latin America to Brazil and Argentina. In doing that, I've gained a unique global perspective that you can't buy, because you have to live it.

When AIG looks at the issues that are happening relative to climate change and insurance, we are looking at some very basic changes with the environment, like water supply. More and more, the concern about water and the concern about the absolute supply of water is manifesting itself much more regularly. When we look at some of the solutions that are out there that are perceived to provide alternative energy sources, we have to look at the amount of water that they consume. To produce a gallon of ethanol, for instance, it takes twice as much liquid to produce that ethanol. There are some very profound issues with water.

Think about the impacts of changing seasonality on peak power demand. What happens when temperatures change? The need for energy changes. Then think about the role of water. If we don't have a reasonable supply of water, then there will be certain forms of energy that will be impacted by it. Power plants need water. If there are abnormal droughts as a result of changing temperatures and differing seasonal patterns, then our electric infrastructure gets impacted by climate change through water.

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I just came back from a trip to the Middle East and India. I met with some investors in Abu Dhabi, where one of their primary concerns is water. How do we sustain our population when faced with low water supplies? Luckily for them, they don't have a large population, but they do have a very rich population that still needs water to survive. Given the issue of water, they are now purchasing equity interests in water technology and management companies and bringing those technologies and management skills to Abu Dhabi so that they can figure out a way to export water throughout the Middle East and North Africa.

They are looking at some very interesting types of water technology. One technology is an innovative irrigation management system that puts sensors in the

roots of vegetation, be it grass, trees, shrubs, or crops. These computerized sensors determine when water is needed at a specific point in time for that vegetation to grow and the amount of fertilizers necessary; both are then automatically distributed. There are some fascinating water technologies being developed, and investors in Abu Dhabi are taking an interest in them.

As an insurance company, we tend to look at catastrophes and changes in the environment and regulation as something that presents us with an opportunity to provide not just a public service by insuring our customers but to also increase shareholder value. We look at everything that is going on in the world concerning climate change and the environment as an opportunity. If you look at the divisions that we have inside of AIG, many of them were set up to respond to opportunities. Take for example D&O (Directors & Officers) insurance. About twenty years ago, during a period when shareholder lawsuits were relatively unknown, a spate of lawsuits involving shareholders suing their Boards of Directors suddenly ensued. AIG came into the market with a Directors and Officers liability policy that became the standard for the market. Whatever is causing a disruption in the marketplace is also seen as an opportunity for an insurer/investor.

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RENEWABLE AND ALTERNATIVE ENERGY

We view renewable and alternative energies and new regulations as issues of opportunity for our business. We have been involved with insuring and investing in renewable energy for a long time. One of the first things that we did once climate change started to become much more public was to set up the Advanced Energy Solutions Group and ecoPractice focusing on alternative and renewable energies and other green initiatives. We then dubbed it an eco-practice. Did we do that because it was a nice thing to do? Absolutely not. We had a number of motivations. There were challenges from climate change. There were also political reasons, because our company is a global citizen made up of people from around the world. And when you look at the trillions of dollars that will be invested in renewable energy, alternative energy, and energy efficiency over the coming decades, it is a business and something a lot of investors really want to be a part of.

If you look at this climate change issue as a business continuum from 1 to 10, with 10 being a developed business and zero being a nascent business, I honestly believe that we are much closer to zero in understanding all of the business potential and implications that are associated with climate change and the opportunities presented by alternative and renewable energy. Therefore, we are just beginning to develop products and services that are meaningful to the buying public.

When we look at alternative energy, there are some people who will try to make it appear as though alternative energy sources are relatively new. Disregarding climate

change for a moment, coal liquefaction technology has been around since World War II, and we really developed it to a higher extent in South Africa. Hydrogen technology is starting to emerge, but in fact, has been around for quite a while. Take biomass, for example. When you look at a typical facility for turning biomass into energy, it is nothing more than a furnace that boils water to create steam and energy. Does this sound like very sophisticated technology?

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Having said that, when we look at solar technology, we know that solar is at an early stage of development, and, to produce any realistic level of power, it will also require taking acres and acres of land to place these photovoltaic panels. Yet there is technology that is being currently developed that, instead of a flat photovoltaic panel, places a series of mirrors that focus solar rays to create an intense source of heat that will in turn create power and provide energy for not only heating but also for cooling.

Look at some of the biofuels like ethanol, which have had a mixed history. We know there need to be technologies to support cellulosic ethanol if we're going to move into a new chapter on energy. Certainly, various plants that produce oil are becoming more prominent and will be part of our future. All of these technologies, whatever they may or will be, have been or will be insured for property and liability insurance, as well as environmental insurance. From an investment perspective, we, as the largest provider of debt and equity investing in the United States, will invest in these technologies from both an equity and debt perspective.

Coming back to some of the statistics, AIG insures 70 percent of the operating capacity for waste energy, 60 percent for geothermal, and 50 percent for wind power. In the wind industry there is a combination of investors, which includes companies like Florida Power and Light, the largest provider of wind power in the United States. There are private investors coming into these markets as well, and we look to insure the performance of these projects and technologies.

We learn from looking at a sector, and we respond to the needs of the market by providing value-added services. Since we have regional operations, we are very close to the changing business trends and the needs of the different markets in which we operate around the world. Given our global presence, we have begun to establish specific programs like the sustainability council we organized in the European Union. This council was established to listen to the needs of our customers as they deal with emerging sustainability trends. The council allows us to take a better look at what

types of risks these companies are confronted with in order to then determine a business response by AIG to address those needs.

With respect to the issue of carbon credits as part of the Kyoto Protocol, it was expected that the carbon credits would encourage investment, and they have. We thought, however, that AIG would be bombarded with requests to insure carbon credits – they haven't yet emerged as an insurable exposure, but they will. Once the full impact of carbon trading hits Europe and other parts of the world, insurance will be needed to cover the delivery risk for carbon credits.

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COAL AND MINERALS

In regards to the coal and minerals sector, it is safe to assume that right now we are still a fossil fuel driven energy world. Based on the information that I have seen, this trend doesn't seem to disappear or change dramatically for another twenty years or so. For coal, there are many different types of risks, including transportation disruptions and flood losses for major mining companies like BHP Billiton and Rio Tinto. These mine floods are disastrous events and they have increased, we think, because of the changes occurring with the environment.

There is also the issue of carbon capture and storage. When we use coal, we are going to emit carbon unless we do something to capture that carbon and store it someplace. We can either bury the carbon emissions from coal, or even inject the CO₂ emissions into a dormant oil well to encourage additional production of oil, recognizing that this oil will lead to the production of more greenhouse gases. The technologies around carbon capture and storage are still new and expensive. In regards to liability, the law is unclear in terms of what happens to the stored carbon should something adverse occur. The U.S. and the states aren't willing to take on that liability. In time, a whole new body of research and approaches will ensue and AIG will identify business opportunities as the markets develop and technologies improve.

OIL AND NATURAL GAS

Given the differing qualities of fossil fuels in the oil and natural gas sector, the production of carbon emissions varies. Some fuels produce less, while others produce more carbon. One of the major risks for the oil and natural gas sector is hurricane damage. Look at what happened to the infrastructure for these sectors with

Hurricanes Rita and Katrina. These were mammoth facilities that were just destroyed with these hurricanes. Clearly when you look at the United States and the Gulf of Mexico, given the number of refining and storage of oil sector-related businesses that exist there, there is still a tremendous risk even to this day of a hurricane-related event impacting the sector.

CHEMICALS

In the chemical sector there is growing demand to improve energy efficiency, especially as it relates to biotechnology. AIG is spending a fair amount of time learning about technologies. What's available today? What's going to be here tomorrow? There are technologies that take bacteria, introduce CO₂, and then produce a form of biodiesel. Unfortunately, one of the side effects is that the bacteria produce waste from this process which makes the technology less cost-effective. There is a lot of work being done in this area, including research with nanotechnology, at different labs around the world.

PAPER AND FORESTRY PRODUCTS

I just had a conversation with a doctoral student here at Yale about forestry and some of the unique risk exposures there. We were talking about the exposure of releasing radioactive materials into the atmosphere that have been stored in the forests surrounding and upwind of Chernobyl. Climate change has a significant impact on forests, especially when you look at the damages that can be caused by wildfires and drought on forests and timber production. As we know, forests are one of the best ways to sequester carbon, and in the case of Chernobyl, radioactive waste too.

INSURANCE PRODUCTS AND SERVICES

AIG is developing a number of products and services to bring to market that will deal with some of these industrial sector risks. We are heavily involved with products involving environmental coverage around clean-up and legal liability around pollution. I will discuss a remediation project later that demonstrates our capability in taking our expertise and regenerating a city to make it productive. We are developing products around carbon credit delivery coverage, which I have already mentioned. One of our companies, Lexington Insurance, has a product that will essentially rebuild a damaged facility or the damaged part of a facility with more energy efficient and green materials. We have both residential and commercial versions of this product called "Upgrade to Green."

We take existing forms of insurance and apply it to things that are relevant today. For example, there is a manufacturer of wallboard targeting the Louisiana and Gulf Coast market. They have a wallboard product that essentially is resistant to winds up to 150 miles per hour and also has a resistance to a certain type of flood. We put up a warranty product at AIG on this wallboard that essentially guarantees that it will perform. If the wallboard product does not perform, then there will be economic

compensation to whoever bought the wallboard. In offering these kinds of products, again we have an ongoing dialogue not only with the manufacturer, but also with the New Orleans Reconstruction Authority to determine what the need for this kind of product is to support the areas of reconstruction.

We also provide project finance advisory services. We are working with the government of Alaska and the Kake Indian Tribe to come up with a program for developing and financing renewable energy that will lead to the replacement of diesel power for the entire state, managing their greenhouse gas emissions more effectively. We have been working with our technology partners at United Technologies, the state government, and some investment capital on these projects to help make them happen.

SUSTAINABILITY INITIATIVES – PARTICIPATION, PROCESS, AND PRODUCTS

When looking at an investment, we look at the investment relative to the sustainability of the company that we're investing in, and factor in the social and environmental responsibility of those companies as well as their governance and ethics before we make an investment. In looking at the environmental aspects of an investment, we clearly look at GHG emissions, the risk of climate change regulations on the business, and the impact the product has on the environment. In regards to social responsibility, before we make an investment we look at a number of things, including diversity, health and safety compliance, as well as transparency and accountability in terms of governance and ethics.

We have a formalized process that we apply regularly to our investments called the 3P process, which includes participation, process, and products. Through this process we are building upon our existing due diligence platforms and embedding the principles of sustainable finance into the architecture of our investments. AIG is a member of the United Nations Environment Programme Finance Initiative, a signatory and sponsor of the Carbon Disclosure Project, and the first major insurer to become a member of the Investor Network for Climate Risk. In regards to the Carbon Disclosure Project¹, this program is focused on how S&P 500 companies voluntarily disclose their greenhouse gas emissions and manage climate change risk. While the Carbon Disclosure Project is voluntary, compliance has been increasing and more information is being made available to investors and others as part of this project.

In regards to products, we have fixed income project finance products for renewable energy. We also make equity investments as well including social awareness and socially responsible mutual funds in the U.S. and abroad. We have a Japanese corporate social responsibility fund and a variety of other equity funds, including the AIG Sustainable Future Fund which I will talk more about. We are taking funds in which we manage, participate, and invest in projects and businesses around the world that are socially responsible and focused on sustainability.

We also invest in infrastructure projects in different parts of the world to assist in enabling those economies to achieve some of the things that are necessary to manage their greenhouse gas emissions. Microfinance is a very interesting investment space

¹ CDP 5 Report, available at: http://www.innovestgroup.com/images/pdf/cdp5_ft500_summary_report.pdf

and we undertake direct investments in these projects through Blue Finance. There are whole segments of society that do not have the ability to access capital and get any kind of finance or credit capability. We are talking here about amounts of money equivalent to borrowing between \$25 and \$50, where access to capital is important to keep a small business alive for a period of time so that their sales can sustain themselves. To support the microfinance markets, there is now something called micro insurance, which I was involved in when I was managing the Africa and Middle East region. We set up a micro insurance product in Uganda that was focused on a very limited accident and health benefit. The accident and health benefit was a death benefit that allowed for the proper burial and financial support for relatives to come in from different parts of the country in order to pay respects to the deceased.

We also invest in companies that develop greenhouse gas abatement projects like Sindicatum Carbon Capital. Sindicatum is a project development company based in London that focuses on various types of carbon-related projects that generate carbon credits and alternative energy. They put funds together to invest in a business or a country that is pursuing greenhouse gas abatement projects which produce carbon credits from things like wind farms, solar power, or some other clean energy project. Sindicatum has also developed a technology that captures methane from coal mines and in some cases turns that methane into an alternative fuel.

On participation, we have a corporate-wide commitment to sustainability, with the objective of creating value to AIG shareholders, clients and employees. We have been recognized as a leader as one of the “100 Most Sustainable Companies” at the World Economic Forum – where we were number 47 on that list. And we have also received a number of green building awards, which I will address.

INVESTMENTS IN THE ENVIRONMENT

Being that we are in the insurance industry, we are a source of funding. We are long-term investors. We are not looking to invest money and take a short-term benefit or gain. As I mentioned, we have invested assets of over \$800 billion, of which \$60 billion is our annual investment appetite. We are working on a \$500 million deal right now with the International Finance Corporation (IFC) to put together a fund that will focus on energy efficiency and clean energy, providing debt financing for businesses that want to improve their efficiency and carbon footprint. As I mentioned, we have project finance investments in renewable energy, with approximately \$450 million in technologies like geothermal, hydroelectric, solar, wind. We recently completed an equity investment in a solar power plant in Spain. The Olivenza Solar Power Plant was a small investment of \$32 million, but is a typical deal for the types of investments that we will be making on a localized basis.

The AIG Sustainable Future Fund focuses on Western and Central Europe as well as other developed and emerging markets. This fund invests in deals of various sizes ranging from 5 to 40 million Euros. It has an industry focus and focuses on clean technology, carbon finance, and nutrition and lifestyle.

We have also done some interesting things with real estate investments. The AIG Centre in Dublin, Ireland, was designed and built with energy efficiency in mind,

including solar shading and natural daylighting, high performance glass, underfloor air distribution systems, and river water for cooling. The AIG Tower in Hong Kong is another example of green real estate. Here we have energy efficient lighting controls and building materials made from sustainable sources. These investments are all aimed at managing our own environmental and carbon footprint.

Within our green real estate investment portfolio, we also have an extraordinary project in Atlantic Station in Atlanta, Georgia. This was the largest urban brownfield project in the United States, involving 138 acres in midtown Atlanta that was deteriorating the property values of the area surrounding it. It was the site of a steel mill that had contaminated the local environment. Our environmental division, directed by Joe Boren, led the remediation of this property. The remediation involved 12,000 truckloads worth of contaminated soil, reclaiming 11 acres of green space, and recycling 150,000 cubic yards of material. In looking at where Atlantic Station was and where it is today, this was an extraordinary accomplishment that was not only good for the environment, but now helps the economy of the city of Atlanta. As a result of Atlantic Station, we have won a number of awards, including the EPA's Best Brownfield Redevelopment Project and recognition by the U.S. Green Building Council via LEED certification.

We also undertook another green real estate project at a resort we own called Mount Mansfield in Stowe, Vermont. Our real estate division invested in a \$300 million expansion of this resort. We worked in collaboration with the Audubon Society in terms of its design to minimize the environmental impact. We provided alternative electric transportation from various parking areas at the resort. That project won an Audubon Society award for the environmental manner in which this project was developed.

These projects are good for the environment and for business. One of the things that I have noticed in terms of making investments in the environment is that you can't have one person in the company who anoints himself as the czar of sustainability or GHG management. Sustainability has to be pervasive throughout the values of the company. It has to permeate the culture of the company. It has to become part of the business of the company. It has to become part of how we develop people in the company. It is a business practice – a regimented business practice in which you believe. Like myself, it took time to understand the benefits of sustainability, but now I have become very passionate about it. This does not just apply to me, but to others throughout AIG who do not engage in this kind of stuff overnight. It's not just about one person, but the entire company.

THE FUTURE

So we have come full circle. Having discussed all of these areas of AIG's business, does this resolve the issue? No, it does not, but what I have discussed gives you a sense of how AIG manages a business in a responsible way by providing products and services to our customers in a way that makes sense and goes a long way to building sustainability in a company, all the while creating long term shareholder value. The

concepts of sustainability and shareholder value are not mutually exclusive and we need more companies to recognize that.

Sustainability has to be pervasive throughout the values of the company. It has to permeate the culture of the company. It has to become part of the business of the company. It has to become part of how we develop people in the company. It is a business practice – a regimented business practice in which you believe. Like myself, it took time to understand the benefits of sustainability, but now I have become very passionate about it.

What does this all come down to when you have a company that is made up of people like you and me? We each have the ability to influence what companies do because we manage the company. As long as we are responsible from the standpoint of the asset base and needs of the company, and as long as we also recognize that we are citizens of the world, then I believe we have a win-win. By pursuing sustainability and shareholder value, we challenge ourselves in new ways. If we don't challenge ourselves on these issues, then what is going to happen?

The concepts of sustainability and shareholder value are not mutually exclusive and we need more companies to recognize that. We each have the ability to influence what companies do because we manage the company. If we don't challenge ourselves on these issues, then what is going to happen?

Let's take nuclear power, for example. You know that 50 percent of the population will say nuclear power is a bad thing and the other 50 percent will say that it is a good thing. People will say, "Well, look at Chernobyl, or look at Three Mile Island." What happened there as a result of nuclear power? Not much happened at Three Mile Island, but Chernobyl was a disaster. And people worry about what else is going to happen. Considering the current safeguards, the fact that in the United States the average age of a nuclear engineer is 48 years old, and the fact that schools are not producing these engineers anymore, and if you believe that nuclear power is part of a climate change formula going forward, then we better do something quickly.

Look at coal as another example. My division is the largest writer of workers' compensation insurance for the coal sector in the United States, so I have a vested interest in what happens up here. You have to ask yourself as the focus on greenhouse gas emissions increases and becomes more intense, what happens to coal without carbon capture and storage? What happens to coal without the ability to get into coal gasification or liquefaction without an adequate capture on top of that as well?

I don't know, but we have all heard about the tar sands in Calgary where the whole issue is whether certain carbon taxes are going to be applied. This alternative source

of fossil fuel with carbon taxes will not survive, because it will then be unaffordable. And herein lies the conundrum. There are issues relative to energy security and climate change, very serious and important issues that have to be dealt with.

With ethanol, the price of tortillas in Mexico went through the roof because everybody was taking corn and turning it into ethanol. Is that a good thing?

With water, there are many challenges in many parts of the world. Consider how we are defining our coastal assets. I'll bet you that if you went down to New Orleans right now, you probably wouldn't see much change in the levees today compared to what existed in 2005. I am not being a critic here, but this is a very complex problem. We don't just build new levees overnight. And then when you consider the displacement of people that occurred, the fact that half the population is gone forever, and that perhaps you were one of the people who had all of their memories and history wiped out in the space of a few days, then these become very complex issues that have to be dealt with. The fact remains that those assets in New Orleans still have to be protected. So how do we prevent things like this from happening again? We have to be sustainable. We have to develop alternative energy. There is an estimate that wind power will see a 700-fold increase over the next 20 to 30 years.

When you look at the issue of the environment and climate change, you have to ask yourselves whether we have a national energy policy that makes sense and is viable. You draw your own conclusion on that. I think this will become one of the main issues that the next President of the United States has to quickly address once he takes office.

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Question and Answer Session

QUESTION 1: Carbon offsets

Thank you very much for your presentation. I'm curious, regarding your sustainability protocol and what you have set up within your company, does it include paying or purchasing carbon credits for everything that AIG uses? If you have looked into it, how much would it cost? And have the shareholders approved it?

Yes, we have purchased carbon offsets to offset our carbon footprint. I don't know what the cost of that was, but clearly there is a process in place within the company to have that kind of expenditure approved. We do have control over it, and it is something that our Board of Directors would have been very involved with since they represent our shareholders. This was not a shareholder initiative per se, but it's something with which the board was personally involved.

QUESTION 2: Pricing delivery risk insurance

Could you talk a little bit more about products that you are developing in terms of carbon credits and the delivery risk for carbon credits? I guess part of the challenge for AIG is how to price these financial products since there isn't really a market for them currently. How are you going to determine what is a fair market value for these products?

The basic issue around pricing is determining what the intrinsic value of the credit is. Currently our customers have not been knocking on our door to insure these credits. I think as the carbon trading mechanisms come further into play, and once those values are established in the market, then you're going to have a number of different products, whether they're hedge products, products that insure the value of those credits, or whatever it might be. What has to happen first and foremost is that there has to be some kind of trading mechanism around the value of these credits. Once that's done, the value and the market, then all of the exposures are pretty well definable because it's just another financial product of interest to the customer.

QUESTION 3: Assessing the long-term variability in water distribution

My question is about water. There's obviously great certainty that climate change is occurring, but, as you mentioned, not great certainty about the distribution of water that may result from that. Can you talk a little bit more about how both sides of your business – the insurance business and the investing business – are assessing that variability?

From the standpoint of our investing criteria, if a source and a guarantee for the access to water is associated with that investment, then we will bring in engineering resources to assess the viability in terms of the supply of water in a given area. The results of this study then play an active part in the decision-making process relative to that investment. There is certainly a lot of public-related data in different parts of the world that relate to the supply of water.

What is more difficult is when you try and project out what the supply of water will be 20 or 30 years from now, and how that is going to be impacted by the changing climate. That analysis is less of a science and more like an art. This is something that we are learning to do to support our estimates and investment considerations. This is an area where new developments in science are necessary, and we are continually learning.

QUESTION 4: CDM insurance

Are any insurance companies insuring CDM projects now in the European market and what about the first years post-Kyoto? Is the risk of delivery fully reflected in the price?

Nobody is guaranteeing the credits at this point in time. What we will insure is the physical entity. For example, if you are investing in windmills in China and getting a credit as a benefit from that investment and something happens to the windmill, we will cover that physical loss of that asset, but not the value of the credit.

QUESTION 5: Flood and storm insurance

It is my job here in the State of Connecticut to prepare for sea level rise and stronger hurricanes – two of the expected outcomes of climate change for coastal regions. Could you help me understand a little bit more about the importance of flood and storm insurance? I have gathered that flood insurance from the private sector is not popular, and in a lot of cases, the insurance companies aren't even offering flood insurance. Could you help me understand when AIG or any other insurance company makes a decision to say, "We're not going to offer insurance policies at any price"? It seems like there always has to be a price that is right for flood insurance. How is that type of decision made?

One of the principal tenets of insurance is something called fortuitous loss – meaning a loss that occurs by accident or chance. For example, when a fire or accident occurs, you are going to pay a loss. However, in certain areas of flooding like in the Gulf of Mexico, that is not necessarily as fortuitous a loss as it might be. It's predictable. You know it is going to happen, and you know you are going to pay the loss. Then it becomes a gamble more than it is a fortuitous loss because there is an inevitability associated with the unfortunate event. Some parts of the United States and the world do not allow you to price this. For example, when you look at what happened to the cost of homeowners insurance in some parts of the Gulf area, people were losing their homes or had to give up their homes because they could not afford to buy homeowner's insurance. It would have cost them thousands and thousands of dollars for flood insurance, which they couldn't afford.

We can charge for such insurance, but how many people out there can really pay for it in that kind of an instance? That is why there need to be federal programs to provide both flood insurance and what they call flood plans. Just like any other business, we have to figure out whether or not an investment is going to make a profit for the business. There are some areas when it comes to flood insurance in particular that you know are not going to make a profit because flooding is such a regular event. In cases of flooding, we are not dealing with just 1 in a 100 or 1 in a 150 year events. Flooding is going to happen. I insure a lot of oil rigs in the Gulf of Mexico. I can tell you that the

wind that tipped those rigs over five years ago has done a lot to that industry. There isn't enough insurance premium in the Gulf of Mexico to pay for that kind of exposure. There are situations where you cannot price insurance because you know you're going to lose money. That's where federal intervention and subsidies have to come in.

We would like to insure these types of cases, and believe me, AIG prides itself on being very creative and proactive in bringing products to market. We were one of the companies that continued to provide flood insurance to different areas of the Gulf of Mexico on a commercial basis. We didn't leave it. There is a certain price associated with that, and those who can afford to pay the price are paying it. You get around this with different levels of deductibles and maximum limits. There is a whole new way of underwriting these risks. It can be done and it is being done at least for commercial customers in particular but not household customers. In regards to household customers, how much can a customer afford to pay for flood insurance? There is a certain budget that you live with, and that is where federal assistance comes in to insure homeowners.

Let's take another example – post 9/11 and insurance products for the airline industry. It is safe to say that immediately post 9/11, no company out there was providing insurance for the airline industry – none, zero, nada. Without that insurance, those planes could not fly. Without that insurance, the banks would not provide financing. Three very senior people in AIG – our former Chairman, the current CEO, and a retired Senior Vice Chairman of the company went to work in the days after 9/11 and put together a product with the capacity, at a price, to enable the airline industry to start flying again absent any security issues. The insurance mechanism does work, but there are limitations when it comes to some of the natural events that you can't predict.

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QUESTION 6: Catastrophe risk

How is AIG changing their operations with respect to catastrophe risk and where do you see this going in the future, given that there is considerable uncertainty about the magnitude of damages resulting from climate change, and especially given the fact that costs for claims have risen tremendously? I don't remember the exact number, but the cumulative catastrophe risk claims between 1980 and 1992, for example, were less than the claims of some subsequent single events.

It all starts with being able to understand where your exposures exist. For example, what if I do not know how much I am insuring that is exposed to wind or flood damage in the Gulf of Mexico? If I don't know, then I am really rolling the dice. We have a very rigorous program for tracking our exposures to risk so that we know exactly what level of risk we have in any given area. That is number one. Number two,

we use some very sophisticated modeling devices that are able to help us understand what the 1 in 150 year event is, the 1 in 500 year event is, and we use that information in order to determine what our exposure to risk is.

In understanding where we have our exposures, in understanding how to use these advanced modeling techniques, we come up with a tolerance for risk. We then say that we can have this much exposure and it has to generate this much in the way of premium in order for us to stay in that market. These are very sophisticated, empirical mathematical and statistical approaches to determine where we develop products to manage these risks.

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QUESTION 7: Uncertainty due to changing probabilities

In terms of those models, the probabilities might change because of climate change. And, at the same time, if you're doing empirical studies, perhaps there have to be two events within the next 50 years to make a statistically significant change to a previously assumed 1 in 100 year event. How do you proceed with this type of uncertainty?

Our underwriters, our actuaries, these modeling companies, are all trying to factor in climate change. Understanding the impact of climate change is still an art in terms of determining how climate change is going to affect floods and winds. It's not like you can look at the date and make an objective assessment any more. This area is evolving. The more we learn about the impact of climate change, the more we are able to reflect that in our models. The more we can reflect that in our models, the more we are able to apply that to how we manage our business.

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QUESTION 8: Catastrophe management capability

What is your opinion in terms of our capacity as a society to handle these types of risks and what institutions need to be strengthened?

When Katrina occurred, one of the saddest moments of my life was watching American people stand by the roadside with helpless looks on their faces. Look at what happened in a society like ours, where we have a democratic form of government and a high level of wealth, when this catastrophe came upon us. We seemingly learned for the first time how to deal with these types of situations and we saw the conflict of control. Who was in control? The city, the state, the federal government? It took FEMA a while to get into New Orleans to help.

I think our capacity to respond to risk has to get better. We have to make sure there is proper coordination. We need to take the politics out of it and empower specific agencies to act without having a specific sanction at a given point in time. The time the catastrophe is occurring is not the time to take a vote, it is the time to act. Sometimes our ability to act is impaired by our form of government.

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There needs to be more investment in catastrophe management capability. I have to tell you that some of those things are being done by private industry. For example, when you look at the wildfires in California, one of the things that we invested in to protect our clients was fire trucks. We had our own fire truck that would essentially go into an area where there was a threat, but they weren't there to put out the fire. They were there to prevent the fire from spreading to our insured clients.

When you look at the floods in the U.K., there was one of our employees going to work and he happened to see the flood waters rising. He was in a group of ours called the Private Client Group, which essentially insures the more expensive homes that are out there. He went back to the office to determine how many homes we were insuring in this area. We then sent trucks out with sandbags to protect those properties, and they weren't damaged . . . except the house next door, which was insured by somebody else. That is an example of how industry needs to take a look at what its responsibilities are and aid and abet our clients in the form of advice, technical consultation, and more participation in an actual catastrophe event.