

ENERGY EFFICIENCY AS AN INSURANCE LOSS-PREVENTION STRATEGY

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Prepared for the Northeast Sustainable Energy Association's *Building Energy* conference
session entitled "How Sustainable Construction Cuts Property Loss"

and

Building Strategies for Managing Risk: A Symposium for Insurers

March 12-15, 1997
Cromwell, Connecticut
USA

SUMMARY

By supporting strategic energy-efficiency and associated indoor environmental quality options, the insurance industry could reduce near-term business risks caused by ordinary insured losses while making a considerable contribution to long-term reductions in greenhouse-gas emissions which also threaten their bottom line. These measures can reduce losses from: fire, ice, wind, and water damage; temperature extremes; occupational injuries; poor indoor air quality; equipment performance problems; theft; and various roadway hazards. The resulting loss-reductions translate into benefits for a variety of insurance lines, including property-casualty, professional liability, medical, life, workers' compensation, business interruption, and automobile. Integrating energy-efficiency and loss-prevention represents an attractive "no-regrets" opportunity for the insurance industry, as the risk-reducing benefits would have distinct value to insurers and their customers irrespective of the timing or extent of damages related to global climate change.

THE INSURANCE INDUSTRY AND GLOBAL CLIMATE CHANGE

The 2-trillion-dollar worldwide insurance industry faces great financial risks from natural disasters potentially caused by global climate change. Natural disasters represent 85% of insured losses worldwide, or \$12.4 billion in 1995. Insured losses from extreme weather events with potential links to climate change, such as windstorms, drought, and floods, are among the most significant areas of concern. A twenty-fold increase in annual insured losses (inflation-adjusted dollars) from windstorm damage since the 1960s is a dramatic indicator of the growing threat to insurers.

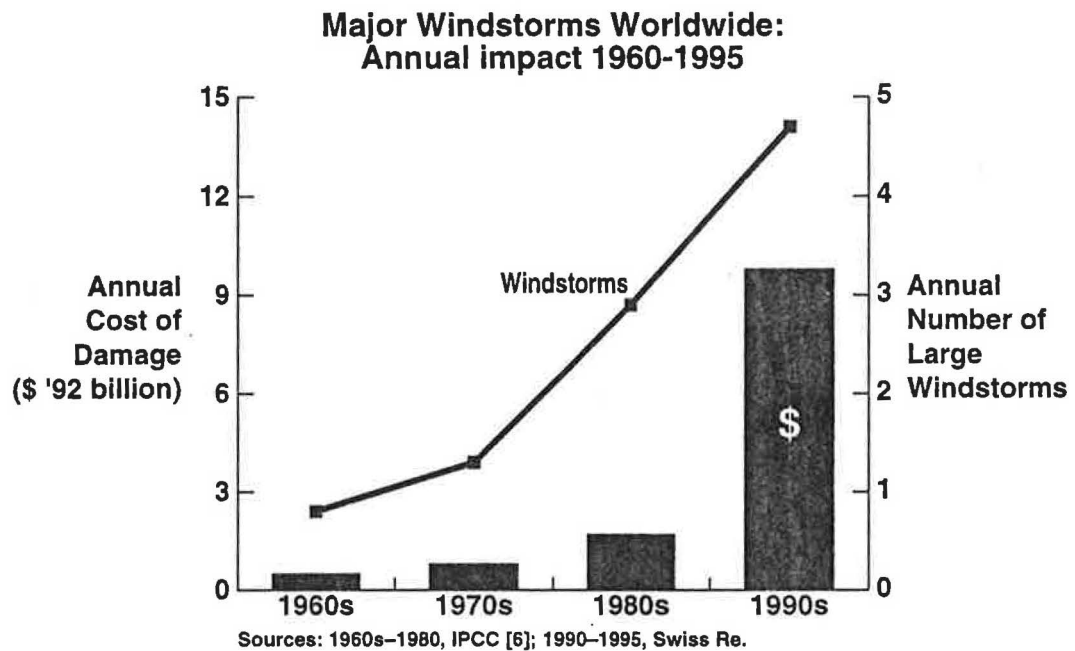


Figure 1. Note that the rate of losses is rising in part due to demographic trends resulting in more concentration of property and populations in high-risk (e.g. coastal) areas and growing numbers of policy holders.

Insurance industry concern in this area is not new. As early as 1990 major insurance companies (e.g. Munich Re) began linking climate change with increased natural-disaster losses. During 1993, a series of headlines in major newspapers described the growing concern within the industry. "Storm Loss New Blow to Insurers", proclaimed *The New York Times*; "Global Warming Makes Insurers Sweat", suggested *London's Financial Times*; "As Insurance Costs from Hurricanes Soar, Higher rates Loom", warned *The Wall Street Journal*. The headlines reflected a strong increase in insured losses from extreme weather events and a series of catastrophic events, including the most damaging storm in the history of the insurance industry, Hurricane Andrew, which led to insured losses in the order of \$US 17 billion followed by rapidly increasing homeowner premiums and even the withdrawal of some insurers from region.

Franklin Nutter, President of the Reinsurance Association of America, summed up the industry's concern this way: "The insurance business is first in line to be affected by climate change.. it could bankrupt the industry". Swiss Re published a report in 1994 stating that "the phenomenon of climatic change is not some vague threat in the distant future but forms part of a process which has already been going on for millions of years [...] Human intervention in the natural climatic system could accelerate global climatic change to such an extent that society might no longer be able to adapt quickly enough to this development".

By the mid-1990s the first insurers started to appear at the international climate negotiations. At the Berlin Climate Summit of April 1995, Munich Re, Swiss Re, Storebrand, Lloyd's of London, and the British Bankers Association sent participants or observers for talks with governments.

The insurance industry is becoming increasingly outspoken, as evidenced by a Statement of Environmental Commitment signed in 1995 at the United Nations by 62 insurance companies from 23 countries, and a formal Position Paper issued by the U.N. group at the 1996 Climate Change Framework meeting in Geneva. U.S.-based Employers Re is a recent signatory to the U.N. statements, and the Reinsurance Association of America continues to issue public statements expressing concern and has endorsed energy efficiency as a practical response option.

As shown by the quotations in the following table, the UNEP initiative has fostered a proactive and precautionary orientation from the insurance industry.

Quotes from the United Nations Insurance Industry Initiative Group

"We are committed to work together to address key issues such as pollution reduction, the efficient use of resources, and climate change"

"We are convinced that it is not possible to quantify anticipated economic and social impacts of climate change fully before taking action. Research is needed to reduce uncertainty but cannot eliminate it entirely."

"We are convinced that the most efficient precautionary measure is substantial reduction of greenhouse gas emissions"

"We insist that negotiations for the Framework Convention on Climate Change must achieve early, substantial reductions in greenhouse gas emissions ... the position of the insurance and reinsurance sector must be represented when discussing or negotiating possible solutions."

The countries represented in the UNEP Insurance Industry Initiative are: Argentina, Australia, Austria, Canada, Germany, Hong Kong, Indonesia, Italy, Japan, New Zealand, Norway, Portugal, Russia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Tanzania, Thailand, United Kingdom, and United States.

The Logic of Loss Prevention

The insurance industry can take a reactive approach to mitigating climate-change risk by raising deductibles or withdrawing coverage. Alternatively, the industry can take a proactive approach by, for example, encouraging actions to reduce greenhouse-gas emissions. Many public and private groups provide their own insurance, and these self-insurers generally have the same interest in loss-prevention as do the commercial insurance companies.

The insurance industry is no stranger to the notion of loss prevention, and often engages in proactive efforts to reduce losses. Promoting loss prevention is not only good corporate citizenship, it directly improves payout/premium ratios--the fundamental indicator of industry profitability. In the U.S. the ~\$30 billion annual insurance property/casualty industry revenues from investments barely compensate for the high ratio of payouts to premium revenues.

Other sectors of the insurance industry provide examples changing customer behavior to cut insurance losses. The insurance industry operated fire departments and promoted early fire and building codes that were then adopted by state and local and then the federal governments.

Underwriters Laboratories represents an insurance industry initiative focused on loss prevention through better technology. More recently, the insurance industry has helped drive significant changes to reduce worker injuries and required insurance compensation. Rising costs of workers compensation and availability of better insurance rates for firms with lower worker compensations costs has pushed companies to adopt proactive practices to aggressively change and enforce lower risk worker practices. This has resulted in substantially better workplace safety, lower worker compensation losses to insurance firms and in turn lower insurance rates for firms.

The Energy-Efficiency Connection

Energy consumption is the largest contributor to global climate change, so promoting energy efficiency is a particularly promising strategy.

Of particular relevance for insurers, many energy-efficient technologies *also* have the potential to reduce ordinary insured losses involving property, health, or liability. Additional insurance benefits come from the improvements in indoor environmental quality that are often associated with energy-efficiency measures. We have identified about 70 specific ways in which targeted energy-efficiency improvements can translate into reduced risk of insured losses (see Table 1). The measures can reduce losses from: fire, ice, wind, and water damage; temperature extremes; occupational injuries; poor indoor air quality; equipment performance problems; theft; and various highway hazards. These loss-reductions translate into benefits for a variety of insurance providers, including property-casualty, professional liability, medical, life, workers' compensation, business interruption, and automobile.

The extent of avoidable property, life, and health losses has not been quantified. In the case of property losses from structural fires, some notable relevant U.S. examples include 157,000 fires, 735 deaths, and \$2.5 billion in insured losses stemming from heating or electrical equipment in buildings. Examples relevant to health and life insurance include 13,000 radon-related lung-cancer deaths annually, 1,500 carbon-monoxide deaths (and 12,000 poisonings), and 700 deaths from urban heat catastrophes. Table 1 suggests various energy-efficiency measures that could mitigate such losses.

Global climate concerns aside, any measure that decreases insurance losses contributes to the bottom lines of both insurers and insureds. By supporting strategic energy-efficiency options, the insurance industry could reduce near-term business risks caused by insured losses and payout levels that consistently exceed premium revenues, while making a considerable contribution to long-term reductions in greenhouse-gas emissions which also threaten their bottom line. This represents an attractive "no-regrets" opportunity for the insurance industry, as the risk-reducing benefits would have distinct value irrespective of the timing or extent of damages related to global climate change.

Proactive Measures and Early Indications of Industry Response

A host of strategies are available to insurers wishing to capitalize on the loss-prevention attributes of energy-efficiency technologies and practices. These include:

- (1) Defining and adopting uniform protocols for quantifying the loss-prevention aspects of specific technologies and practices and certifying their application
- (2) Developing innovative insurance products (e.g. premium discounts) that reward safety-enhancing energy efficiency measures
- (3) Supporting appropriate building and appliance codes and standards

- (4) Financing customer efficiency improvements as a new business line
- (5) Supporting performance labeling of buildings and energy-using devices within them
- (6) Establishing investment portfolios that support key energy-efficiency technologies and services
- (7) "Leading by example" by making buildings owned by insurance companies more energy-efficient
- (8) Fostering improved energy efficiency and indoor air quality in the process of financing and purchasing buildings. (Insurance companies own and lease a considerable fraction of the U.S. building stock and provide considerable amounts of debt financing).
- (9) Encouraging the application of loss-prevention technologies during reconstruction of buildings following losses
- (10) Forming customer-focused partnerships with energy utilities and other current actors in the energy-efficiency marketplace
- (11) Exploring the issues and opportunities associated with the application of these concepts in the context of developing countries.
- (12) Supporting research and development and commercialization of new technologies and services

A handful of early efforts by insurers and other stakeholders demonstrate that energy efficiency has begun to find a strategic position in the insurance industry.

- Hanover Insurance company (c. 1980) gave a 10% break for energy efficient/solar homes, with the justification that the heating systems fired less often resulting in a reduced fire hazard.
- A major professional liability insurer has reviewed twelve largest cases and identified numerous ways in which commissioning (an energy-efficiency measure emphasizing quality control) would have helped avoid claims. As a result, they are considering offering 10% premium credits for design and engineering firms that practice commissioning.
- The Insurance Institute for Property Loss Reduction has endorsed the enforcement of building energy codes.
- The Pacific Gas and Electric Company--one of the United States' largest utilities--has formed an alliance with the insurance industry's Western Insurance Information Service to further encourage wise and efficient energy use by its customers. PG&E's goal is to have every potential energy project considered for risk management benefits.
- In another utility-related effort, the Electric Power Research Institute has formed the Disaster Recovery Business Alliance (DRBA). DRBA will help catalyze the disaster mitigation objectives of utilities, business leaders, the insurance industry, government agencies, and community leaders by launching regional alliances and ensuring the cohesive deployment of relevant mitigation and socio-economic recover technologies. The program involves a three-pronged approach: distributing information, fostering extensive planning among regional and local businesses, and applying technologies to mitigate losses and expedite recovery. Certain energy-efficiency technologies will no doubt find a place in this process.

- Three European insurance companies have joined in with an International Energy Agency project to use the purchasing power of building owners to create markets for energy-efficient copiers.
- The Oak Ridge National Laboratory has entered into a Cooperative Research and Development Agreement with the Roofing Industry Committee on Wind Issues, which includes all major roofing trade associations in North America and various insurance partners (the Insurance Institute for Property Loss Reduction, K2 Technologies, Risk Management Solutions, and Allstate). The project will investigate energy-efficient ways of making roofs more resistant to damage during windstorms.
- The Consumer Products Safety Commission and Underwriters Laboratories are scrutinizing the safety aspects of halogen torchiere light fixtures, a process which will strongly encourage the use of energy-efficient compact fluorescent lamps as a substitute technology.
- The Zurich-American Insurance Group offers specialized insurance policies for third-party energy service companies that implement energy efficiency technologies in exchange for a share of the savings. The policies protect the installer or building owner against over-achievement of contracted energy savings targets.
- The newly-founded Storebrand Scudder Environmental Value fund is an early example of environmental investing, to which insurance companies (Swiss Re, Gerling, Anova, and Trygg-Hansa) have already contributed \$70 million. Energy efficiency is one of the criteria used to evaluate securities being considered for inclusion in this fund.

While the preceding list demonstrates concrete and interesting ways in which the insurance industry can engage itself in the energy-efficiency marketplace, the activities to-date have only begun to tap the potential.

ACKNOWLEDGMENT

This work was funded by the Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Technologies and State and Community Programs, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098 and by the U.S. Environmental Protection Agency, Atmospheric Pollution Prevention Division.

REFERENCES

For an extensive treatment of this topic, see E. Mills. 1996. "Energy Efficiency: No-Regrets Climate Change Insurance for the Insurance Industry". *Journal of the Society of Insurance Research*, pp. 21-58 (Fall).

See also, E. Mills and I. Knoepfel. 1997. "Energy Efficiency as a Loss-Prevention Strategy for the Insurance Industry", *Proceedings of the 1997 ECEEE Summer Study*, European Council for an Energy-Efficient Economy, Copenhagen (forthcoming).

A host of related resources are gathered on the World Wide Web and can be viewed via the following site -- <http://eande.lbl.gov/CBS/Climate-Insurance/ci.html>

BIOGRAPHICAL SKETCH

Dr. Mills has worked in the energy field as an economist, engineer, and policy analyst since the early 1980s, and now leads Lawrence Berkeley National Laboratory's Center for Building Science, one of the world's top energy efficiency R&D centers, with a staff of 225 people.

Table 1. Potential for energy-efficient technologies to prevent insured losses.

Energy Efficiency Measure	Insured Risk Mitigated								
	Fire & Wind Damage	Ice & Water Damage	Extreme Temperature Episodes	Power Failures	Professional Liability	Roadway Safety	Theft	Health & Safety (Lighting)	Health & Safety (Indoor Air)
Air Vest for spray booths									√
Building commissioning	√	√			√			√	√
Central heating controls									√
Compact fluorescent lamps								√	
Daylighting				√				√	
Demand-controlled ventilation	√			√					√
Economizer cooling					√				√
Efficient appliances	√			√	√				√
Efficient duct systems	√	√			√				√
Efficient outdoor/road lighting							√	√	
Efficient roadway lighting						√			
Efficient windows	√	√					√		
Electrochromic glazings							√		
Electronic lighting ballasts	√							√	
Energy mg't. & control system							√		
Energy audits & diagnostics					√			√	√
Extra interior gypsum board	√								√
Heat-recovery ventilation		√							√
Insulated water pipes		√	√						
LED exit signs				√		√		√	
LED traffic signal lights									
Light-colored roofs	√		√	√					√
Measurement & Verification	√	√			√			√	√
Natural ventilation				√					√
Pay-As-You-Drive insurance						√			
Radiant barriers	√								
Radiant hydronic cooling				√					√
Radon-resistant housing									√
Reduce indoor poll. sources					√			√	√
Reduced mercury in lighting									
Roof/attic insulation		√	√						
Sealed-combustion appliances	√				√				√
Thermal energy storage	√								
Torchiere light fixture with CFL	√								

Source: Lawrence Berkeley National Laboratory