

Insurance Shocks



Market Behaviour and Government Responses
International Case Studies with Relevance to New Zealand

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Contents

Executive Summary	1
Purpose of this report	1
Situation	1
Findings	4
The Insurance Problem	6
Analysis	8
The Case Studies	13
UK: Subsidence	13
UK: Flood	16
Australia: Flood	19
California: Earthquake	23
Florida: Hurricane	26
USA: Fair Access to Insurance Requirements (FAIR) Plans	29
Glossary	36

Executive Summary

The seismic activity in Canterbury since September 2010 has led to a reappraisal of the earthquake risk in New Zealand by the insurance industry. There are signs that insurance cover is becoming more expensive and restricted than it has in the past, to the extent that the insurance market may not provide for the needs of home and business owners.

Purpose of this report

This report provides information on overseas cases where insurance market crises have occurred. Insurance provider behaviour as perils¹ become more certain as to time and place can be observed in other areas of the world. The reactions of regulators and governments, including the outcome of their market interventions, can be used to indicate possible outcomes in New Zealand.

This report analyses the overseas experience with reference to lessons for New Zealand and draws some conclusions on what we can learn. The report makes no specific recommendations or findings. These would need to be based upon some preliminary decisions about the extent to which central or local government (or both) should intervene in the provision of affordable insurance, if they should intervene at all, and what financial consequences would be tolerated.

At the end of the report are case studies of most of the interventions mentioned in the body of the report. These are by no means the only international cases, and there are others with lessons for New Zealand. The chosen cases, though, collectively provide a reasonable overview of overseas experience with regard to the facilitation of affordable insurance for property owners.

Most market interventions by governments, both those detailed here and others, are aimed at homeowners. Some do also include business owners, even extending to compensation for business interruption. Where this report refers to property owners, as opposed to homeowners, it can be assumed that business property owners are included.

Situation

While damaging aftershocks are still expected to strike Canterbury, insurance companies are wary of providing coverage. Their revised perception of the risk will alter their underwriting criteria for the area, possibly extending to the whole country. Non-supply of insurance may be a shorter term problem if it arises from a perception that seismic activity is still occurring, but there is little doubt that stricter underwriting terms and conditions under which cover is granted, are going to remain.

There are engineering remedies to enable foundations to be built in liquefiable soils but insurance companies may not include their significant cost in current claims settlements. Owners of buildings requiring foundation improvements may have difficulty obtaining affordable insurance and, if lenders insist on insurance as a condition for advancing loans, a vicious circle has been formed. This will add to the problem of homes that are

¹ A "peril" in insurance terminology is a cause of damage, e.g. fire, burglary, liability, earthquake.

built on improved foundations being over-capitalised, the owners being unable to recoup the cost in the market value of the property.

The situation in Canterbury could lead to insurance market failure, at least temporarily. The events of the past year or so have led insurance companies to recognise that a review of their risk assessment is needed, but there is not yet the information available to enable this exercise to proceed. In the meantime, insurance companies are being cautious to the point of limiting their exposure by not issuing policies unless this is necessary to maintain a market presence, or by withdrawing altogether.

Insurance companies' identification of the worst risks should lead to a rebalancing of premium charges with the removal of any cross subsidy of the bad by the better. Rewarding the good risks sends a signal that encourages mitigation and an aggregate reduction in premium levels would then follow. However there are time and motivation aspects that confound this process.

Insurance companies may not reduce premiums for good risks while they are loading premiums for the bad, because they believe this is not justified (they had the general level of premium wrong in the first place, perhaps because of a previously unanticipated cause of claims), or they are pricing themselves off the market rather than risking the reaction to bald refusals to insure. Punitive risk pricing leaves the slowest movers in the market with a portfolio of policies that others have priced themselves off. Stragglers are selected against and face a worse claims outcome than their fleetier competitors. To avoid this position, all insurers raise their premiums on poor risks. Competition in these circumstances drives prices up; this is also the situation if insurers load the premiums on poor risks before they review and revise premium levels for better propositions.

New Zealand has a market intervention mechanism, the Earthquake Commission. While it has avoided disadvantages of other systems, it lacks some features like risk-based pricing, coverage for business risks and means of encouraging mitigation. The Commission could take on roles that government agencies in other jurisdictions have, for example as a reinsurer, special purpose vehicle in the issue of catastrophe bonds, facilitator of taxation trade-offs and administrator of post disaster funding of disasters through the market.

UK: Subsidence

The UK Government has declined to become involved to counter affordability and availability issues in relation to insurance against subsidence damage, so we can observe the insurance market in action without any extraneous intervention.

Subsidence cover is particularly associated with domestic property in the UK. Lending institutions became aware of the danger of subsidence and persuaded insurers to add coverage to their policies without extra premium in 1971. Insurers now face an influx of subsidence claims in years of dry weather. Particularly susceptible parts of the country can be readily identified at post code levels and insurers apply punitive conditions to policies in those areas; homeowners whose properties have a history of subsidence find it hard to get insurance at all, affecting market value and borrowing capacity.

There are now insurance agents specialising in the placement of subsidence-prone properties with insurance companies that are prepared to consider each risk on its own merits. Thus a case must be made by the property owner, supported by engineering reports, and this can be expensive.

UK: Flood

The UK Government showed more concern when the availability of insurance against flood became problematic. Rather than direct intervention, though, an accommodation with the insurance industry was reached. This case shows how such a protocol could be utilised and why it is not a permanent solution.

Following devastating floods in several areas of the UK since the 1990s, insurance companies started "redlining" (withdrawing insurance from) some areas. This led to discussions between representatives of the industry and government.

The result was a "*Statement of Principles on the Provision of Flood Insurance*", under which the insurance industry agreed to continue to make cover available provided the UK Environment Agency announced plans to reduce the risk in the area to below "significant" (i.e. 1 in 75) within five years. This joint commitment is due to expire on 1 July 2013, when the parties have agreed that conditions should be in place to enable a resumption of normal insurance procedures.

Australia: Flood

The Government in Australia has expressed itself unwilling to intervene in the provision of disaster insurance. However, the industry's attempts to provide coverage that it feels it can underwrite has led to such a confusion of definitions and lack of standardisation that, in the face of serious flooding, the Commonwealth Government may have to act. The proposal of a scheme that makes the offer of insurance compulsory, accompanied by discounted premiums and a reinsurance facility, has not yet been accepted but is an interesting model.

Australia is one of a number of developed countries that does not have universal flood insurance as part of standard homeowners' policies for either contents or buildings. Nevertheless, many homeowners regard their policies as giving them full protection. This is partly because of the confusing semantics surrounding the peril, which differentiate flood, flash flood, riverine flood, storm, rainwater and internal systems as being covered or excluded. Different insurers have different offerings that range from no provision at all to full flood cover, via a restricted wording most often excluding riverine flooding. Insurance companies have been known to ignore their own wordings to avoid bad publicity after a notable flood event and, on occasion, consumer and government pressure has forced insurance companies to pay invalid claims.

Recently the Commonwealth Government convened a review panel to investigate the availability and affordability of flood insurance. The panel has recommended Government intervention to enable lower cost flood insurance to be offered to homeowners in the worst flood-prone areas, by way of a reinsurance facility that carries a government guarantee.

California: Earthquake

The California Earthquake Authority (CEA) is not funded or guaranteed by the State, although it was set up by legislation to resolve the lack of availability of earthquake insurance for homeowners. A diminishing proportion of the finance comes from participating insurance companies, which comprise almost 80% of the residential property insurance market, and the CEA has utilised reinsurance and capital markets. Recent catastrophe bonds issued on behalf of the CEA illustrate how this mechanism can be used to transfer risk.

In 1985, California passed legislation requiring insurance companies that sell residential property insurance to offer earthquake cover on homeowners' policies. After the 1994 Northridge earthquake there was an upsurge in take-up of this compulsory offer. Insurers' concerns about a blow-out in their exposure and the inadequacy of their pricing systems led them to withdraw from offering homeowners cover at all in the face of the Legislature's refusal to consider lifting the earthquake offer mandate. This led to what could be called a state-induced market failure.

Although residential earthquake insurance in California is a wholly voluntary purchase, policymakers were concerned that an absence of availability would eliminate an important recovery option in quake-prone areas. California's answer was to create the California Earthquake Authority, a State-managed but privately financed organisation that provides a separate earthquake policy on normal market terms to go with private sector homeowners' policies.

Florida: Hurricane

In Florida, the state is involved in private sector market regulation, direct insurance and reinsurance, the result of crises in the cost of hurricane insurance coverage and the capacity of insurance companies to provide it. Florida's statutory insurance providers' ability to use post-disaster imposts to cover deficits spreads their liability to future policyholders and taxpayers.

Following Hurricane Andrew in 1992, which bankrupted eleven insurance companies, reinsurance capacity for Florida contracted and direct insurers ceased writing business in the state. To counter this market failure, which was the result at least partially of the state regulation of insurance pricing to limit increases to consumers, the Legislature imposed a moratorium on companies leaving Florida.

Before the moratorium expired, the State Government created a trust to increase available insurance capacity. Participation was compulsory for insurance companies licensed for business in Florida. The Florida Hurricane Catastrophe Fund provides reinsurance at about one third of the normal market price. At the same time a last resort facility for homeowners unable to purchase cover in the private sector was set up.

The two facilities' claims paying ability is heavily dependent on post disaster levies, taxes and revenue

bond issues. There are concerns about the State and population's ability to service such a burden after a major hurricane, or series of hurricanes.

USA: Fair Access to Insurance Requirements (FAIR Plans)

Many states in the USA have legislated into existence last resort insurance arrangements that enable homeowners and businesses to purchase cover in severe weather prone areas. These FAIR Plans show how high risk subjects for insurance are redistributed to the private sector, how reinsurance and alternative risk transfer methods can be utilised, how mitigation can be encouraged and how linkages can be made to taxation levers and compulsory provision of cover. All the Plans employ pre- and post-event funding arrangements

Hawaii: Hurricane

The Hawaii Hurricane Relief Fund (HHRF) was created as a state agency in 1993 following Hurricane Iniki. As with Hurricane Andrew in Florida, the reaction of insurance companies was to substantially reduce their writing of homeowners' policies. The state made hurricane cover compulsory on homeowners' insurance and the HHRF provided a hurricane extension for participating insurance companies. The income of the Fund was derived from its own premium charge, a levy on insurance premiums and a fee on mortgage agreements. There was also provision for post-disaster levies and borrowings.

No further hurricane activity was experienced and insurance providers started returning to the market in 2000. In 2002, the activities of the HHRF were suspended. The Fund remains dormant and officially capable of reactivation should insurance market failure again arise in Hawaii. In the meantime the state has sequestered first investment income and then the capital of the Fund and there are concerns over the viability of the reactivation plan.

Findings

Intervention in the insurance markets in other countries has been prompted by problems of:

- affordability of cover, especially by homeowners – UK and US flood insurance
- the availability of cover because of insurers' underwriting decisions – US FAIR Plans
- the lack of capacity in the industry to provide cover (perhaps because of the underwriting decisions of global reinsurance entities) – Florida hurricane insurance
- the variability of the terms and conditions of cover that creates confusion and under-utilisation – Australia flood insurance.

These symptoms are inter-related and several may appear in New Zealand as they did in California with regard to earthquake insurance.

The circumstances in the Canterbury region are potentially conducive to insurance market failure for any of the above reasons. Companies are able to identify areas subject to severe liquefaction and to take underwriting measures to limit or exclude their exposure in these areas. Competition will drive premiums up as insurers try to leave the worse cases to be insured by other companies. A parallel to the UK subsidence crisis can be recognised, and homes and businesses that have sustained liquefaction damage, or are close to those that have, are in danger of finding their future insurance needs are unaffordable or, at best, unattractive due to high deductibles.

Mitigation measures against liquefaction can be taken. Insurance companies may insist on these for individual properties or encourage them through premiums and terms adjustments, and require assurances of effectiveness at the owners' expense. Measures benefiting communities, like sub-surface damming, could be used in negotiations between government and the industry in the way that the UK flood *Statement of Principles* was agreed. The mitigation measure of rezoning badly liquefied areas so that rehabilitation is not allowed may blunt insurance company reaction. At least this presents a permanent resolution, whereas any agreement along the lines of the UK flood arrangement could not be sustained indefinitely.

The USA's National Flood Insurance Program (NFIP) is a permanent, comprehensive partnership between local and central government. The NFIP shows how identification, mitigation and risk-based pricing of insurance can be linked. By increasing the incidence of insurance purchase in high-risk areas, even at sometimes discounted premiums, the NFIP demonstrates the economic feasibility of such a system, compared with the complete reliance of the uninsured on government assistance following a disaster. The example of the NFIP could be of

interest here if the insurance industry's reaction to the Canterbury earthquakes reduces take-up of insurance dramatically below New Zealand's normally high levels,

Factors of availability and affordability of earthquake insurance could extend over the entire country, at least in the short term. Taking a longer view, insurance companies may revert to differentiating in terms of perceived seismicity, much as they did before the Canterbury event, if they are persuaded by scientists, brokers and clients that the magnitude of the loss from the February earthquake was due to a combination of circumstances that is unlikely to apply to other locations. If they are unable or unwilling to differentiate the earthquake risk to the same extent as liquefaction, and regard the whole of New Zealand, or at least the major part of it, as more susceptible to earthquake damage than before, they will permanently increase their terms and pricing accordingly.

Pricing of natural disaster insurance is controlled by the wholesale insurance market, the reinsurance companies that take over much of the risk.

New Zealand policyholders face the situation that the natural disaster element of their premiums has been well below world averages in the past. Reinsurers are now looking to add a correction of this to their need for more funding to recover from their Canterbury losses; this also at a time when worldwide catastrophe activity has been high and investors in insurance and reinsurance companies are seeking a three- or four-fold increase in returns on their capital because their perception of the risk has changed to that extent.

EQC shields homeowners from some of the effects of these pricing pressures, even with the recent trebling of its own premium rate. EQC faces a severe impact on its own reinsurance purchase as do the insurance companies, which will have to pass this on to policyholders.

The recent review² of Australian flood insurance availability and affordability has recognised the central part played by reinsurance and recommended that the Commonwealth Government utilises advantages it can bring to bear to provide companies with lower-cost reinsurance backing. This would, in turn, allow insurance companies to make more affordable cover available to homeowners and small businesses. A government guarantee is a needed feature to

encourage use by insurance companies of such a structure. Where mitigation is possible, for example in zones of marginally liquefiable soils, an agreement between government and the insurance industry along the lines of the UK *Statement of Principles* may help small businesses in their struggle to recover. Post disaster funding arrangements, such as the US programmes, formalise another possible line of investigation, to cover the contingent risk posed by the temporal uncertainty of any probability calculations included in underwriting formulae.

The California Earthquake Authority and the Florida Hurricane Catastrophe Fund are examples of schemes that are designed to cope with the problem that the natural disaster risk is so large in world terms that it cannot be successfully diversified even globally. In Florida's case this is exacerbated by the fact that the hurricane risk must be combined with the Caribbean countries and the Gulf of Mexico states as potentially a single event. Lack of world market capacity is not the case with New Zealand but the schemes do show how a solution of a mixture of traditional reinsurance, catastrophe bonds and significant co-insurance by policyholders through high deductibles or post-disaster imposts, or both, may be utilised.

Government liability incurred through EQC can be transferred to either the conventional reinsurance market or, as the California Earthquake Authority (CEA) and others have now done, to the capital markets through a catastrophe bond. With the New Zealand Government as issuer, EQC could act as the transforming special purpose vehicle, playing the same role as especially set up Embarcadero Re does for the CEA. Catastrophe bonds have been utilised – or are being tested – to transfer larger amounts of liability to the capital markets than is represented by the earthquake risk in New Zealand. For EQC, the traditional reinsurance market has to date offered better value but when the pricing of both instruments is changing, attention to both markets would be prudent, if the New Zealand Government wishes to consider protecting its own balance sheet from the shock of a natural disaster like an urban earthquake.

² "The Natural Disaster Insurance Review, an Inquiry into Flood Insurance and Related Matters", Commonwealth of Australia, September 2011, ISBN 978-0-642-74739-6.

The Insurance Problem

While we are in the long abatement period of the Canterbury earthquakes episode, when damaging aftershocks are still expected, insurance companies are wary of providing insurance coverage.

Their perception is that damage is still occurring and – on the analogy that a house that is on fire cannot be insured until the fire has been extinguished – they are not prepared to provide insurance protection. This is the short-term aspect of the problem; as soon as insurers can be persuaded that the event has concluded, they will re-enter the market on terms influenced by the longer term calculations of underwriters and extrinsic matters like worldwide claims experience and financial returns available on the capital required to provide security for the risks being underwritten.

Outside the specialist earthquake insurance underwriting fraternity there was little appreciation of the risk posed by the Canterbury region before September 2010. The accepted wisdom was that insurance exposure in the lower North Island was the correct focus with regard to major earthquake losses in New Zealand. Not only have the events in Canterbury shifted attention to that area, but the extent and severity of the earthquake sequence has also been unexpected.

Underwriters' revised understanding of the risk will alter their insurance approach to the area and, probably, the whole country. The previously recognised North Island exposure has not gone away (in fact, some are claiming, without specific scientific backing beyond the general observation that earthquakes tend sometimes to swarm, that it has been exacerbated by the neighbouring seismic activity) and the shock of Canterbury will prompt queries about what other

surprises New Zealand may have in store for insurers. Damage ratios – the extent to which individual structures are expected to be damaged – that are the basis of computerised potential loss calculations, are already receiving attention.

Reinsurance companies, including Lloyds' syndicates, insure the liabilities of insurance companies, which package their catastrophe risk and transfer much of it to the global reinsurance market. The insurance companies pass on the premiums they are charged plus their own mark-up, just like a retailer in any mercantile environment. Nowadays, to price the risk, these reinsurance underwriters make use of scientific knowledge and extensive data about the properties being insured, which they can run through especially designed computer applications. The resulting "technical rate" is loaded by an "uncertainty" factor that may be many times the calculated rate³. The Canterbury experience has significantly increased the uncertainty factor, pending the enhancement of the computer models with the new knowledge gained from the events.

So, while non-supply of insurance may be a short-term problem, there is little doubt that the new insights into the vulnerability of built structures will lead to

³ "Uncertainty" refers to timing as well as occurrence. However confident one may be about a probability measure, there is still the chance of an early event or series of events – hence the 1 in 100 year flood that occurs, with statistical validity, twice in ten years.

permanent stricter underwriting terms and conditions on which cover is granted, once the insurance market is reactivated.

The Canterbury/New Zealand situation needs to be considered also within the context of the global reinsurance market. Various factors cause pricing to move in cycles and the market is currently in a hardening phase. A series of recent large events – for example floods in Thailand and Australia, the earthquake and tsunami in Japan and tornadoes in the USA – as well as the Canterbury earthquakes, have driven prices up and investment income on the capital reserves that reinsurance companies have to carry has not been sufficient to cushion the effects of these claims pay-outs to any great extent.

The global market situation lends force to high insurance costs in Canterbury and elsewhere in the medium term.

The present situation is that insurance companies are refusing to renew fire policies (which cover property damage and consequential losses, including by natural perils) or issue new policies for properties in some areas, notably those prone to liquefaction. If companies do renew their fire policies, they may not provide “top-up” cover on residential (homeowners’ and contents) insurance for the perils that EQC insures up to its caps on sums insured.

When cover is available, premiums are barely affordable and terms and conditions very restrictive. For example, deductible (excess) levels on commercial property insurance have climbed into the thousands of dollars, or even millions in the cases of very large portfolios of properties. Consequential loss policies like business interruption insurance are also very expensive and limited.

There are engineering remedies to enable foundations to be built in liquefiable soils but insurance companies may not include their significant cost in current claims settlements. Owners of buildings requiring foundation improvements may have difficulty obtaining affordable insurance and, if lenders insist on insurance as a condition for advancing loans, a vicious circle has been formed. Homes that are built on improved foundations could become over-capitalised if the market does not recognise this as adding sufficient value.

Some insurance companies are considering withdrawal from the Canterbury market altogether, either perforce,

because they have gone out of business, or as a strategic decision. This renders the already thin insurance market in New Zealand even more so.

Financially, the terms of coverage offered by insurance companies make non-insurance for both homeowners and business people a rational decision. But insurance is part of the commercial fabric. Without insurance, the housing market is disabled because banks are reluctant to lend without insurance coverage on the security for their loan and most people would not purchase a property they would be unable to insure, or could not afford to insure. Lending to businesses is also constrained by the requirements of the lender and, without insurance, a business owner is deprived of the chief method of transferring risk. Owning or running an uninsured business is too risky for most to contemplate. Studies by economists have shown that economic activity is less efficient when the insurance market is not functioning well.⁴

What is happening in Canterbury is an example of the insurance market re-establishing itself on terms that insurance buyers find punishing. The events of the last eighteen months or so have led underwriters to recognise that a review of their risk assessment is needed, but there is not yet the information available to enable this exercise to proceed. In the meantime, insurance companies are being cautious to the point of limiting their exposure by not issuing policies unless this is necessary to maintain a market presence, or by withdrawing altogether.

The condition of the insurance market in Canterbury and New Zealand once perils have become more certain as to time and place can be conjectured by observations from other areas of the world. The addenda case studies provided are instances. How they were resolved, or how they resolved themselves (and how long it took), may indicate not only how the Canterbury situation will progress, but what may be needed either to stimulate the insurance market to recover or to replace some elements of it.

⁴ See, for example, “*What is the role of insurance in economic development?*”, 2008, Dr. Lael Brainard, Bernard L. Schwartz Chair in International Economics at the Brookings Institution and member of the International Advisory Council for Zurich Financial Services.

Analysis

The story of insurance against subsidence damage in UK illustrates how the private sector market reacts in the absence of any intervention from a regulator or government. The reluctance of the Australian government to intervene in the flood insurance market has also been noted.

There is a tension between the insurance model's reliance on a statistically viable number of homogeneous subjects randomly susceptible to the peril covered on the one hand, and the striving for greater certainty of knowledge about individual subjects on the other. As uncertainty is replaced by knowledge, and especially if probability also becomes more fixed, the insurance mechanism fails, since it requires fortuity, not certainty, in order to operate.

Technology is playing a crucial role. Weather satellites, global positioning devices, satellite mapping, increasing computing power and high definition digital imaging are among advances that have revolutionised insurance underwriting. Risk can now be isolated to small groups of a score or so structures, or even individual buildings. Flood plain maps contributed to the renewed underwriting attention to UK flood insurance and hurricane risk computer models are influential in the USA. Cross subsidies are eliminated as the worst risks are isolated and charged their fair contribution to the insurance pool. Technology is enabling greater certainty.

Individual companies will react to a previously unsuspected peril by trying to identify the worst subjects and altering the terms and conditions under which they will continue coverage. Late responders in the market are at risk of being selected against as they inadvertently offer the best terms for insurance of the subjects that are the worst prospects for claims. This "devil take the hind-most" aspect of the insurance

market mechanism acts against normal competitive pressures that keep prices low and, in situations like the UK subsidence crisis or – possibly – the liquefaction problem in Canterbury, insurance terms are ratcheted up rather than down as insurance companies try to price the worst risks realistically or relinquish them to their competitors.

The supposed advent of lower premiums for good risks and, with the motivation of the price differential to take mitigation measures, an overall reduction in the premium level, have been found in practice to lag far behind the rate increases, if it happens at all.

The situation is exacerbated if insurance companies, not wishing to directly refuse cover, instead price themselves off the market, i.e. quote premiums and terms they know (or hope) will be unacceptable. As well as not baldly refusing to continue on risk, insurance companies' community conscience may run to industry agreements like the UK *Domestic Subsidence Claims Handling Agreement* that determined which company was liable to pay a claim when a homeowner had transferred to a new provider before discovering subsidence damage.

In trying to isolate the worst risks for special attention, resolve liability issues and tighten their policy wordings, companies introduce additional costs and this redistribution of income is of no overall benefit to society.

The outcomes of the inability to purchase insurance cover are illustrated by the UK subsidence crisis. These include the acceleration of urban blight, albeit in quite small pockets, and the difficulty of the property market to function. The interest taken by mortgage lenders in insurance coverage has a great influence on such outcomes. In the USA the federal mortgage agencies, Freddie Mac and Fanny Mae, require insurance against hurricane damage but not earthquake damage. This has affected the outcomes for the California Earthquake Authority in California, which has a modest take-up rate by homeowners, as compared to the situations in Florida and the Gulf states with their FAIR (Fair Access to Insurance Requirements) Plans.

In New Zealand, lender requirements are driving insurance needs and this, in turn, is affecting the earthquake recovery. The issue extends to businesses and is affecting commercial activity.

Faced with insurance market failure, authorities have the choice of fostering or replacing the insurance process. An example of the former is the UK flood risk case.

The insurance companies that were members of the Association of British Insurers (ABI) accepted UK Government assurances of improving the flood risk by investing in mitigation measures and, in return, agreed not to take the most extreme measures in relation to flood-prone homes and small businesses. This assured many policyholders of continual coverage from their existing insurer but there were no undertakings on premium levels or other terms and conditions.

The *Statement of Principles on Flood Insurance* was an attempt to reign in the pure insurance market reaction the UK had experienced with regard to the subsidence crisis. The *Statement* has succeeded in continuing to make insurance available but the effect it has had on premiums and terms is more questionable. It was never considered more than a stop-gap measure and failures to meet undertakings on both sides have sealed its fate. Insurance companies can price themselves out of the market, thereby meeting their commercial needs whilst staying within the agreement. This behaviour has been prompted by the fact that not all companies are signatories to the *Statement* and so can more effectively "cherry pick" only the good risks. The UK Government has not met its obligations with regard to improving flood protection throughout the country.

The UK Government sees merit in the development of a specialist flood insurance market and thinks its

agreement with the industry is an impediment to this, because adherents have to continue to offer coverage. A specialist insurance company would act as insurer of last resort and properly risk-rate each subject on its own merits.

An agreement between the Insurance Council of New Zealand and the New Zealand Government in relation to the earthquake and liquefaction risks in Canterbury and elsewhere could require members of the Council to continue to make coverage available in return for promised investment in physical protection measures, tighter building codes (including for retrofits) and land use planning reform. The challenges lie in communicating that such an agreement will not include price controls so property owners still will face stricter insurance terms, should include all parties (some insurance companies are not members of the Insurance Council) and will adhere for some years to commitments made. Any agreement would have to have a "sunset clause" because it would distort market dynamics, as does the *Statement of Principles* in UK, and the effort would have to be made to have procedures and processes in place for when the agreement is due to expire.

The National Flood Insurance Program (NFIP) of the USA creates a permanent, comprehensive and more formal relationship among parties trying to reduce risk while compensating those who fall foul of it. It does not include the insurance industry in its arrangements because the national government designs and funds the insurance scheme, although it largely delegates the running of it to the insurance industry.

There are three integrated components of the Program. First, flood-prone communities are identified and 100 year flood maps are produced for them (communities can join the scheme before this exercise is completed but they qualify for only limited insurance coverage). There is a requirement that communities adopt and enforce floodplain management regulations, and flood insurance is provided at terms that reflect adherence to the plan as well as location, construction, use and age of the buildings being insured. The Program links with other federal mitigation measures such as provisions for mandatory purchase of property at risk and the Hazard Mitigation Grants Program set up under the Stafford Act to assist State and local authorities.

The insurance problems in Australia, and also in Florida with regard to hurricane insurance, have stemmed in part from the different horizons of local and central

government. The former has to have a short-term focus on land development and revenue-producing activity like granting building consents and expanding the rating base. The results of developments sanctioned by local government can have repercussions for a century and may have to be addressed nationally.

The NFIP creates an alliance between central and local government under which the information required to actuarially price insurance on each property is obtained and published by central government; mitigation measures are rewarded and failures to meet requirements, continued inhabitation of particularly hazardous zones and multiple claims are penalised. Failures on the part of local government have repercussions on the insurance coverage of property owners and this provides the necessary focus of attention.

Congress could not bring itself to allow the full force of risk-rating to take effect. Discounts are allowed for buildings that pre-date the Program's commencement in 1968, and "grandfathering" is practised when areas are re-zoned. No person's insurance premium can rise more than 10% in a year.

Had it not been for Hurricane Katrina in 2005, the NFIP may have continued in a somewhat precarious financial state, but demonstrating the way that insurance could be provided within an overall programme for improving vulnerability while in the meantime providing insurance with pricing for individuals based on their particular risk level, i.e. "risk-rating" rather than national solidarity upon which EQC and other schemes are based.

The NFIP has reduced levels of non-insurance for flood damage and thereby also reduced the burden on the State and Federal Governments for assistance following a disaster. Although the discounts in the system do not make the Program fully self-funding, more of those most at risk are making a contribution and there is an overall economic justification. The NFIP is not permitted to build reserves in case of catastrophes, relying instead on a US Government guarantee of loan availability. The result of Hurricane Katrina is that the Program is currently in debt to the US Treasury for some \$18 billion following the legislation's set down process by which funds are made available following a catastrophe.

The Australian insurance market has tried to avoid insuring against flood damage in the face of pressure

from consumers and governments to do so. In attempting to meet the demand, insurance companies resorted to extensive descriptions of what they were prepared to insure against, and what they were not. This hair splitting caused confusion and dissatisfaction when storm or flood events occurred, and the public had to resort to pressure on companies to ignore their wordings or provide *ex gratia* claims settlements.

The Commonwealth Government of Australia has for many years refused to become directly involved in flood insurance, and has made some failed attempts at indirect involvement. In 2011 it decided to investigate the extent of market failure and whether it was sufficient to warrant intervention. The Review Panel has recommended some central government action to ensure the availability of insurance for all at affordable premiums. The Government would have to administer some sort of discount premium system, including making it acceptable to insurance companies by providing a reinsurance facility. Key features of the scheme would include a requirement to offer flood cover as standard, government investment in mitigation measures to reduce the extent of discounts needed and a government guarantee of the reinsurance liabilities.

The extent to which the recommendations will be adopted has yet to be seen. Whether or not Australia sets up the agency and reinsurance pool, the concept may have some application in New Zealand. The notion of government as insurer of last resort is not new and is the *de facto* position in many countries. Setting up a mechanism to better manage this situation, as New Zealand has, enables the protection of the government's liability arising from this insurance activity, for example with the issue of national catastrophe bonds, to be explored. In New Zealand it is possible to conceive of EQC managing a pool with the features of the proposed Australian scheme for discounted insurance premiums through a central reinsurance facility.

In Florida, the reinsurance premiums charged by the Florida Hurricane Catastrophe Fund are independently calculated to reflect the risk and do not incorporate cross subsidies. Nevertheless they are estimated to be about one third of the open market levels, justified by the tax-exempt status, low overheads (including no agency commissions) and absence of a profit

or contingency factor⁵. These are all applicable to EQC. This pricing also relies heavily on the ability to fund losses after the event; more than 40% of the claims from the 1 in 50 year hurricane in Florida will be financed post disaster. Not only are private sector companies not able to count on this capability, in jurisdictions like Florida there is precedent for the legislature to act against their ability even to increase their premiums after a disaster.

There is no need for EQC to build the reserves a private reinsurance company has to, and there is a large pool of policyholders over which deficits can be spread post disaster, as is currently happening with regard to the Canterbury pay-out. Furthermore, there would be no pressure to obtain an adequate return on capital. Like the Florida Fund, EQC could provide reinsurance cover at much lower premiums than the private sector, and this would in turn reduce premium levels charged to property owners by insurance companies that are ceding part of their risk to EQC. This is the argument being put forward for the creation of an Australian reinsurance pool.

The pricing structure of some FAIR Plans, including Florida Citizens Property Insurance Corporation, has a parallel in New Zealand, where EQC has for its whole 65-year existence not charged an actuarially sound premium, relying on the Crown guarantee to meet any shortfall. This guarantee may be in the form of a grant or a loan, so future policyholders may be required to repay it. Now that EQC is in deficit, its premium rate is being trebled. Loan repayments and heavier premiums could be regarded as post disaster funding of the Canterbury earthquake losses, in line with expectations on policyholders and taxpayers to post-fund deficits in the FAIR Plans.

FAIR plans in the other states of the USA have various mechanisms for post-event funding of their deficits, including limits on how much may be passed on to policyholders, or on the levies on the industry before the issue of revenue bonds is resorted to.

Until the Natural Disaster Fund in New Zealand was exhausted by the Canterbury episode, present generations were paying for future generations.

5 Insurance and reinsurance companies have to charge more than the actuarially calculated premium. Each risk they take on potentially increases their average cost of capital. Investors demand higher returns for capital placed at higher risk. Insurers also have to load in an uncertainty factor, even for perils with a well specified probability because this still leaves uncertain the actual timing of low probability events like natural disasters.

Now the Fund needs replenishment, the position is the other way round. This is also the situation in Florida and many of the Gulf states recovering from hurricane strikes.

The California Earthquake Authority (CEA) is the latest in a line of market interventions originally designed to ensure affordable insurance but instead threatened market failure. Each step tried to rectify the unexpected consequences of the last. The CEA has addressed the supply-side matter of insurance availability but not managed to make headway with the demand-side in the form of cover that consumers are inclined to buy. The CEA has not yet faced a large pay-out, so to date its benefit has been to free up the residential real estate market by making insurance available; its effectiveness in the financial recovery from a serious earthquake remains to be seen.

New Zealand has its own State-run insurance scheme that is more comprehensive in the perils covered, more restrictive in the limits of cover, simpler in its policy and premium structure, and – with a Crown guarantee – does not have to contemplate insolvency. EQC does not involve insurance companies in its funding arrangements or its claims handling.

The CEA and some FAIR Plans have taken a lead in the development of alternative risk transfer mechanisms, although the Caribbean Catastrophe Risk Insurance Fund and Taiwan Residential Earthquake Insurance Pool have also issued catastrophe bonds⁶. The capital markets could be considered in New Zealand for the provision of protection for the General Fund against having to meet the Crown guarantee to EQC, especially while the Natural Disaster Fund is being replenished. The US intention to enable the issue of post-event bonds by central government is also of interest with regard to the future funding of EQC.

The FAIR Plans and Florida illustrate an ambiguity often faced by regulators. On the one hand they wish to provide affordable insurance to counter a market failure but on the other they often require the agency to charge premiums sufficient to cover losses and not to institute cross subsidies. In the case of Florida Citizens Property Insurance Corporation, this manifested itself in 2006 when a proposed premium increase was vetoed by the legislature and replaced with a premium freeze until 2010.

6 In Taiwan's case it seems the bond issue was for political reasons rather than financial, and when the bond expired, it was not repeated because of the expense.

The intervention in the Hawaii insurance market followed the patterns established in Florida and California, with the added concept that the mechanism could be turned on and off as market failure presented itself, then was corrected. This has not had to be tested, but two challenges are evident: the switching on and off of the administrative support required⁷, and maintaining a fund in the face of the pressing financial needs of the state. The latter has caused much controversy and political debate, involving the executive director and the board in public disagreement with current government policy.

FAIR plans mutualise the risk at least to all policyholders in the state and in some cases to all taxpayers. They provide a link to the taxation system when tax offsets on post-event funding are to be allowed, and to regulations making insurance compulsory, as in South Carolina. They are also a vehicle for the purchase of market-wide reinsurance or of alternative risk transfer mechanisms like catastrophe bonds. EQC could feature in any of these arrangements if decided upon in this country. Market share-based participation in FAIR schemes entails the supply by insurance companies of detailed information to some central authority to certify the share.

Like the other US cases, the FAIR schemes are examples of regional rather than national attempts to remedy market failure. They show how such constructs have to deal with a wider insurance market and low barriers to entry or exit. If attempts were to be made to try to regulate insurance company product offerings in New Zealand, careful consideration would need to be given to the options open to companies, including leaving the country. For most companies, New Zealand is a small market in their worldwide or Asian/Australasian portfolios. It needs to be noted, though, that FAIR plans are common in USA so avoiding highly regulated markets is not the straightforward task it would be in New Zealand.

7 The Hurricane Relief Fund still exists with a small staff, who were not laid off on the basis that the organisation had been successful and making staff redundant would send the wrong signal to other state departments in Hawaii that were performing well. There is also an extant board of directors.

The Case Studies

UK: Subsidence

The UK experience with insurance against subsidence is an example of how the insurance market, left to itself, reacts to the emergence of a sudden phenomenon that is unexpectedly covered by its policies, presenting challenges both for the continued profitability of the market and the settlement of claims. The obvious analogy is with liquefaction effects in Canterbury. The UK Government did not intervene in the subsidence crisis in the UK and the market has been left to find its own solutions. It is claimed by some (for example, see Reference 1) that the result is not in the best interest of homeowners including, at a societal level, those with no subsidence problem, because lack of insurance availability leads to neglected or derelict neighbourhoods.

The counter argument is that costs are being correctly applied in proportion to the risk, without cross subsidisation. The disadvantages and controversy of a risk equalization pool, with its losses borne by all homeowners, are avoided. Hard as it is on the owner of a subsidence-prone building, there is the strongest possible incentive to take mitigation measures and thus, over time, improve the subsidence risk to homes in the UK.

Subsidence in the UK occurs in England in the north-east where past and present coal mining activity features, in limestone and chalk country in the south where cavities may develop (as tomos do in New Zealand, for example in the Taupo and Auckland areas occasionally) and in the Fens and Norfolk Broads area of loose, wind-blown sands and soft silts. However, the reason for the insurance industry's crisis over subsidence was the shrinkable clay soils typical of the south-east, including London, large areas of which are built on "London clay".

In dry conditions these clay soils shrink with the removal of moisture and in wet conditions take up water and expand causing cycles of subsidence and

heave. In the damp summers and drier winters that were the typical weather pattern of that part of England, this characteristic of the soil did not usually matter. Since the second half of the twentieth century, UK rainfall patterns have altered and there is a tendency to drier summers.

In the 1960s, a rapid growth in home ownership in UK coincided with a decline in summer rainfall. The bank and building society mortgage lending institutions became aware of the danger of subsidence on the clay soils of south-east England and in 1971 persuaded insurers to add coverage for "subsidence, landslip and heave" at no extra charge to their homeowners' insurance policies. As a result of the exceptionally dry

summer of 1976, insurers paid out over £100 million in subsidence claims on homes and they now face an influx of subsidence claims in years of dry weather, for example in 1990, 1991, 1995, 2003 and 2006. By the turn of the century the total claims pay-outs had exceeded £3 billion.

Although this pay-out over 25 years to a population of 50-60 million may not seem to present a major problem for insurance companies, it is their reaction to a peril that can be isolated to specific geographical areas (down to post code level) that is of interest.

From an individual loss point of view, the liability of the insurance company for damage to a home from subsidence or heave can be extensive. A homeowner insurance policy will normally cover all damage to the building, including walls, gates, fences, patios, drives and swimming pools if the building is also damaged. If the home cannot be lived in, policies pay for the cost of comparable alternative accommodation. The average claim for subsidence damage is several thousand pounds and, if it includes foundation remediation, could be as high as £100,000.

From the 1970s insurance companies had to cope with claims for extensive repairs and property betterment caused by a peril that had been unanticipated and uncoded. Furthermore claims could be complex for a phenomenon that could take years to manifest itself and then continue to occur over a considerable time. The insurance industry is capable of reacting quickly to try to counter the impact of an unanticipated peril that suddenly creates a claims surge and this can place policyholders at a disadvantage.⁸ Insurance companies' response to subsidence included:

- Sharply increasing premiums and excesses for properties in subsidence-prone areas, which have become better defined over time, from a postal district graininess of about 100,000 properties in 1991 to a postal sector refinement of about fifteen buildings today. Some companies now work on an individual property basis and some have been accused of "pricing themselves out of the market" rather than earning the bad publicity associated with refusing insurance cover.
- Strongly differentiating across regions. Those deemed to be in more hazardous areas have had their premium rates multiplied rather than merely loaded by a percentage. Excesses can be as high as £3,000. Before the subsidence crisis, most companies applied a countrywide uniform premium structure with excesses in the region of 3% of the claim value.
- Requiring structural surveys at the owner's expense of buildings constructed before 1980 (when new regulations governing the depth and quality of foundations came into force) in the most subsidence-prone areas.
- Refusing to accept new proposals to insure houses in some areas (postcodes) or houses with a history of subsidence. Events more than twenty years old, without any further instances, may still be deemed material. By 1995 it was possible to trace every house in the UK that had had a subsidence at some time "which is bad luck for anybody living next door"⁹. There is no evidence that insurance companies have cancelled or refused to renew a homeowner's policy because of the subsidence risk but some have declined to insure a new owner. This affects the value of the property and even the possibility of a sale.
- Expending significant sums on trying to identify bad risks. This was in part due to property owners or their brokers responding to premium hikes and differentiation measures by obtaining their own information to present their homes in a better light to insurance underwriters.
- Disputing liability when a homeowner had changed insurers before discovering subsidence damage. Since 1994 most members of the Association of British Insurers have subscribed to the *Domestic Subsidence Claims Handling Agreement* which sets out which insurer will be responsible for handling any claim.¹⁰

8 An example in addition to the subsidence crisis is when it became clear in 1997 that the volcano in Montserrat would probably destroy every building on the island. The insurance companies reacted by invoking the seven days cancellation notice in their policies. Policyholders, who may have paid their premiums for decades, were left unprotected, as were mortgagees who then called in loans under conditions of the mortgage contract.

9 The *Sunday Times* summed up, "The situation is bad for houses with cracks, houses which once had cracks, houses next to houses with cracks and houses in areas where houses once had cracks."

10 If a claim is made within the first eight weeks of the changeover, the previous insurer will deal with it. Claims between 8 weeks and 1 year will be handled by the new insurer with the cost of settlement shared equally between the two insurers. Any claim made a year after the changeover will be dealt with by the new insurer alone.

- Applying policy conditions strictly; two examples being voiding policies for non-disclosure of previous evidence of subsidence when proposing for insurance whether the home owner was aware of it or not, and declining claims on grounds of late notice when they were not notified as soon as the circumstances were recognised.
- When a claim is made, arranging for a structural engineering inspection. This is to find out what work needs to be done, and also whether there has been non-disclosure or a failure to take reasonable precautions (thus giving grounds for avoiding the claim).
- In the earlier years claims were more readily settled for the cost of underpinning foundations, but insurers then challenged the necessity of such an expensive measure in order to discharge their liability. Claims are now more likely to be limited to localised building work, the pruning of trees and repair of drains, with the insurer then recognising the high subsidence risk and hiking premiums, increasing the excess and requiring the homeowner to take reasonable steps to prevent a recurrence.

Building regulations are being strengthened to require foundations on clay soils to be improved. This will differentiate new housing from existing stock, which will remain problematic unless the foundations have been strengthened and deepened, a major undertaking for a homeowner. A vicious circle develops when homeowners attempt to finance the significant cost of remedying chronic subsidence by improving the foundation structure: lenders require insurance on their security and insurers will not cover buildings at risk of subsidence.

There is no doubt that there will remain a large proportion of the susceptible housing stock with shallow and inadequate foundations, for which risk improvements are not feasible. Particular areas can suffer property blight where clusters of homes all have a subsidence problem.

Tree species selection and management are becoming important considerations for house owners and their insurers. Some insurers and brokers have issued advice on suitable planting distances from buildings and drains of various species of tree and shrub, together with guidance on correct pruning. Some insurance proposal forms seek information about what plants are in the vicinity of the home.

In the UK there are several insurance intermediaries (brokers) who specialise in obtaining insurance for non-standard risks like subsidence. They often (for a fee) have the property inspected and make an individual case to insurance companies prepared to offer terms. These may comprise a lower insured limit and a high excess, but premiums will be lower than the homeowner is currently facing. In other words, the cover becomes bespoke rather than a commoditised offering. There is also a company offering insurance on houses with a subsidence history, under its PUPS (Previously Underpinned Properties Scheme) programme.

The insurance market in the UK will continue to be wary of insuring homes at risk of subsidence. Owners of such properties are effectively tied to the one company that will continue to insure them, unless they take up the lower limits and higher excesses of a specialist company. Sale of these homes is problematic, with some insurers declining to accept a change of ownership and using the sale as a reason to come off risk. Homes with the stigma of a postcode on the insurance industry's watch list or with a previous claim for subsidence have reduced in market value.

In Canterbury, New Zealand, there is evidence of companies already adopting the same tactics to deal with insurance issues there. It is not hard to foresee owners of homes in areas of liquefaction, or who have made claims associated with liquefaction, being in the same position as those in the UK with regard to subsidence; having to go to a lot of expense to present their individual situation in a better light or to obtain any insurance cover; enduring a loss of market value or even possibility of sale and a severe restriction on their insurance choices. In the much smaller New Zealand market, it is difficult to foresee a profitable market niche for a specialist insurer and thus one of the UK government's arguments for non-involvement is negated. The possibility of an overseas broker or company providing such a service must be tempered with the need for detailed knowledge of the area and the situation before any products could be designed.

In contrast to the UK, the authorities in Florida did decide to involve themselves in the problem of sink-holes. They are a common feature of the state's landscape because of the underlying carbonate rocks like limestone and dolomite. All insurance companies are obliged by law to offer cover against structural damage by "catastrophic ground cover collapse". In 2010, the largest insurer in the state, Citizens Property

Insurance Corporation, paid out US\$245 million in claims from a subsidence risk premium pool of only US\$32 million. Although it is Florida's state-owned insurer of last resort, Citizens has a 40% market share of household policies. Its losses are mutualised to all Floridians through tax exemption, the right to issue revenue bonds and the ability to levy insurance companies and their policyholder post-event to cover underwriting losses, including the repayment of the bonds.

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UK: Flood

The identification of flood-prone areas by insurance companies for either exclusion from cover or the application of punitive terms created a problem for a sufficient number of homeowners to cause a reaction from the UK Government. There is a reluctance to regulate the market directly in the UK so a different approach was taken.

This case illustrates how authorities and the insurance industry may agree a protocol to facilitate a competitive market for the insurance needs of homeowners and business owners. Such agreements may alleviate the problem but if they are voluntary, not all-inclusive and do not address the issue comprehensively (price controls were not included in the UK protocol), then they can be only a means of buying valuable time for the formulation of a more long-standing solution.

Continued attention to the underlying issue of the failure of the market to provide an affordable insurance product is therefore a necessary part of the partnership between government and the industry. Successful mitigation measures would make a major contribution to the resolution of the problem. Thus the settlement of a protocol between the New Zealand Government and the insurance industry may be a way of buying time while unstable land in the Christchurch area is remediated by central or local authorities, after which the insurance industry could regard such areas as amenable to affordable insurance.

Flood cover in the UK has traditionally been included in uniform homeowners' policies at no differentiated charge. This changed in the 1990s after devastating floods in several areas of the UK and warnings that climate change could make such events more regular. The insurance industry reacted in much the same way as it did to the subsidence crisis: by differentiating flood-risk areas for higher premiums and excesses, limiting the availability of cover and insisting on much more detailed underwriting information. "Flood zones"

tended to be larger and more numerous than the areas isolated as being at severe subsidence risk. Sizeable towns and cities were being included and this, together with the fact that community mitigation measures were feasible – unlike for subsidence – may have convinced local and central government to intervene, in contrast to the subsidence crisis.

Insurers in the UK were warned, on the basis of climatic trends, that the future could well bring more severe and extensive flooding. Such forecasts were

contemporaneous with the development of computer models that could delineate flood-prone areas, both from empirical evidence and topographical features. Newly developed satellite imaging technology was also employed to illustrate the flood risk.

Utilising new techniques, the *UK Flood Estimation Handbook* was produced by the Natural Environment Research Council in 2000. It offered guidance on rainfall and river flood frequency estimation in the UK. These estimates formed the basis of flood risk maps. The *Handbook* also provided methods of assessing the probability of notable rainfalls or floods and these were of particular interest to insurance companies.

An Association of British Insurers (ABI) report in 2000 (Reference 3) estimated that between 950,000 and 1.2 million properties in the UK (4% of total building stock) were at risk of flooding. The total insured value of property at risk was put at £35 billion. The report found that scenarios of £1 to £2 billion of losses from a single event were not unrealistic and a month after its release a flood event cost insurers £1.3 billion.

This and large events in ensuing years brought home the point that, in some areas, floods were an inevitability and therefore uninsurable. Since 2000, insurers have paid out over £4.5 billion in flood claims, twice as much as in the previous decade.

Increased flood risk was recognised as due to both climatic trends and socio-economic factors, with more people taking up residence in flood-prone areas. For example in the years between 1985 and 2004, over 350,000 residential properties were built on flood plains in the UK.

With their claims experience, new tools and climate change concerns, insurance companies commenced the cycle of identification of flood-prone areas, penalty premiums and insurance provisions, the "cherry picking" process of acceptance or rejection, withdrawal from some areas (known as "redlining") and requiring expensive reports from insurance proponents.

Public and government concern over the availability of flood insurance in the UK led the ABI and the UK Government in 2000 to negotiate a "*Statement of Principles on Flood Insurance*". In the short term this committed insurance companies to continue to provide flood insurance at terms that reflected the risk in a competitive market and the Government to manage the risk of flooding.

ABI members undertook to continue to provide flood insurance as part of their normal residential and small business policy offerings if the flood risk was *not significant* (defined as 1 in 75 probability) and to continue to offer flood cover to existing customers *at significant risk* provided the Government Environment Agency announced plans to reduce the risk to those customers below "significant" within five years.

It was recognised from the outset that the *Statement of Principles* may distort the market, hinder the development of specialist flood insurance for the more difficult cases (as happened for subsidence risks) and limit incentives to property owners to take mitigation measures. So the *Statement* was given a finite life, to 2013, with a free market to operate from then. Any significant external shock in the meantime, like the withdrawal of reinsurance capacity, would trigger a review of the *Statement*.

Following an announcement by the UK Government of more and better investment in flood defences, the ABI issued a new *Statement of Principles* in 2002. By then about one in ten of the UK's 20 million homes and businesses was in a flood plain. About three quarters of these were protected at or above the minimum standard of 1 in 75 for urban areas set by the Department of Environment, Food and Rural Affairs (DEFRA), and would continue to qualify for inclusion of flood in standard insurance policies. Other existing policyholders would continue to be offered insurance if flood defences were scheduled for completion by 2007.

In areas that had no actual or planned flood defences, insurance companies would treat each case on its own merits and "use their best efforts to continue to provide cover". This could include offering cover provided certain action was taken by owners to mitigate the risk.

Insurance companies undertook to allow the transfer of their insurance policies to new owners on their purchase of properties in significant flood risk areas provided they were themselves acceptable proponents, especially with regard to their claims records. For business premises, a change of occupation would also be a consideration.

Again the *Statement's* aim was to ensure a competitive market for insurance based on the actual risk of flooding. In other words, insurance would continue to be offered but companies were free to set their own terms and conditions. Other objectives were to encourage the Government and local authorities to invest in flood defences, make better use of new

mitigation measures (like water-resistant plaster), provide for those who wish to sell their homes and businesses and reduce uncertainty for those in high-risk areas.

The *Statement of Principles* was reviewed in 2005. At that date there were estimated to be 2.2 million properties insured in areas with at best a 1 in 75 risk of flooding, therefore attracting the Government obligation under the *Statement* to mitigate. In some areas there were such plans but in others there were not.

The renewed agreement recognised that the level to which properties were defended above the significant risk standard varied and premiums would reflect this; also that properties in highly populated coastal areas were expected to have higher standards of protection because of the severer consequences should flood occur.

In areas where no mitigation measures were scheduled, there was no guarantee to maintain insurance cover but each property would be assessed individually. Insurers would work with the owner, the Environment Agency and the local authority to try to make the property insurable in some form.

Continued operation of the *Statement* required Government action in five areas, with annual review and assessment against performance targets:

- Reducing the probability of flooding for a substantial number of properties that currently have a greater than 1 in 75 probability (this is quite a high probability for an insurance risk, and in that respect the target is modest).
- At least maintaining the level of investment in flood management each year so that outputs can be sustained in real terms.
- Implementing reforms to the land use planning system to control new developments.
- Communicating flood risk effectively.
- Developing an integrated approach to urban drainage to alleviate the risk of sewer flooding and flash flooding.

Most of these provisions were carry-overs or developments of clauses in the previously agreed *Statement*. The *Statement of Principles* was not to apply to homes built after 2008.

The 2008 review identified measures to be taken to provide a long-term solution that would enable flood insurance to continue to be as widely available as possible without distorting the insurance market. The following actions were identified:

- Improved understanding of flood risk probability and consequences.
- Long-term strategies to improve flood risk.
- Ensure the planning system prevents development in flood-risk areas, or that any essential development is flood resistant.
- Raise public awareness in areas of significant flood risk and encourage mitigation measures.
- Promote access to insurance by low-income households.

Through DEFRA, the UK Government has expressed a commitment to ensuring flood insurance remains widely available "in England"¹¹ after 2013. The Government and insurance industry, through the ABI, have continued a dialogue up to the present day, mainly through three working groups, covering options for managing the financial risk beyond 2013, the provision of flood risk information and resistance and resilience measures available to property owners.

The UK Government has decided not to become directly involved in the insurance market beyond investigating subsidising premiums for those most in need, because such expenditure of taxpayers' money would do nothing to protect communities against the health and well-being impacts of flooding. The Government sees the advent of a specialist flood risk market (as has occurred in association with the subsidence risk) as a positive effect of the insurance industry's stricter risk-based pricing. The *Statement of Principles* is said to have limited the development of such a market by enforcing the continuation of the signatories in offering flood cover. The Government believes a specialist market will lead to stronger incentives on property owners and communities to mitigate their own risk.

The UK Government has opted to invest in reducing the risk through construction of physical barriers and better communications, for example the Environment Agency's flood warning service and information on preparation and protection on a government web site. In the latter endeavour they are being assisted by the ABI and other insurance organisations; a *Homeowner's Guide to Flood Resilience* was produced to coincide with "Know Your Flood Risk Week" in 2011.

With the 2013 deadline approaching, warnings of steeply increasing insurance terms in flood-prone areas

¹¹ Northern Ireland and Scotland have their own government/ insurance industry agreements. Wales appears to come under the "English" agreement.

are being made, despite the fact that the *Statement* never controlled these terms. There are accusations in the news media that companies are already trying to rid themselves of at-risk homes by pricing themselves off the market. Premium increases of 66% and excesses of £15,000 to £20,000 have been cited. There are also fears that insurance companies will decline to transfer policies to new owners, as has happened with regard to properties at risk of subsidence.

The ABI has reiterated that the *Statement of Principles* will not be renewed because it has forced a subsidy from those in lower risk areas to those in higher risk areas (i.e. it has not allowed true risk-rating), tied those in high-risk areas to one insurance company and enabled selection against the companies bound by the *Statement* by forcing them to continue to take on risk in the most hazardous areas. The ABI has published research (Reference 7) showing that three quarters of properties in areas of significant flood risk are not paying a high enough risk premium. The ABI estimates that, after 2013, about 200,000 high risk homes will struggle to afford insurance cover and they want the UK Government to adopt an insurer of last resort role in some form.

The ABI and others have expressed concern that Government activities are not achieving the level of improvement aimed for and have intimated a lack of

commitment by central government. The Environment Agency's flood risk management budget needed to rise by 9% to meet its obligations under the *Statement* but in fact it had been reduced by over 10%.

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Australia: Flood

Flood insurance in Australia has the challenges of availability, affordability and poor take-up by homeowners. This last challenge is partly due to the lack of standard cover leading to confusion over what benefits the purchase of insurance actually bestows.

As in UK, Australian governments have been reluctant to regulate coverage but a new report is recommending intervention by way of a scheme to make insurance more affordable in flood prone areas, backed by a central reinsurance facility to which companies may transfer part of their liability, operated at the Commonwealth Government's risk.

In New Zealand the Earthquake Commission currently provides affordable natural disaster cover, at the New Zealand Government's risk, for homeowners who are willing and able to purchase fire insurance, but the provision of cover to non-residential property owners is in the private sector. If the economic recovery from the earthquakes in Canterbury is seen to be hindered by the non-availability of affordable insurance for businesses, then the provision of reinsurance that enables cover to be provided more cheaply, utilising government's advantages, could be considered.

Australian governments and the industry have reviewed the flood insurance situation after almost every major flooding event since 1974 and have made several attempts to find solutions that would be acceptable to consumers and the industry. The Brisbane floods in that year, for which the majority of homes had insurance cover, were three times the previous largest pay-out by the Australian insurance industry and led to flood losses being widely excluded from policies from that date. This in turn prompted the Commonwealth Government to set up an investigation into the feasibility of a special scheme to cover natural disaster damage. It recommended a pooling arrangement among insurance companies for natural disaster damage but the industry could not agree on this, despite the need being highlighted by Cyclone Tracey's hit on Darwin not long after the investigation commenced. In 1979, the Commonwealth Government announced that it would not be involving itself in natural disaster insurance.

Australian companies have become mired in attempts to define coverage and there was no industry-wide agreement. Generally, companies insured storm water damage but not flood water damage. The difference is, of course, not always clear. The common requirement for the flood definitions is the escape/overflow of water from the normal confines of a natural water course or body of water. This can extend to modified or artificial water courses such as redirected rivers or creeks and storm water channels. The definitions also sometimes include water released from dams and water which cannot enter a watercourse or body of water because it is already full or overflowing. Some policies that exclude flood damage nevertheless include damage by flash flooding.

As an example, one insurance company provides cover for up to 20% of the sum insured for flood caused by rain falling in the previous 24 hour period. Another gives cover for the full sum insured for flooding that occurs during a storm where the rise in water levels has been the direct result of that storm. One household policy states:

"We will not pay for damage caused by:

- *the seas or tidal wave;*
- *flood.*

A flood means the covering of normally dry land by water escaping or released from the confines of:

- *a natural or artificial watercourse, canal;*
- *storm water channel;*
- *a lake, dam, reservoir.*

But:

You are insured ... when water ... accidentally escapes from:

- *road guttering or curbing".*

The distinctions among flood, storm and flash flooding can be technical enough to require expert opinion, interpretation of satellite imagery and eyewitness statements setting out the sequence of events, time of inundations and even colour of the water and nature of the debris in it. To policyholders, the distinctions are beyond comprehension and seem artificial, albeit they represent sound underwriting. The insurance doctrine of proximate cause often comes into play, to the further confusion of consumers, local body staff and politicians.

A recent natural disaster in south-east Queensland could have different outcomes for policyholders:

- Damage in one town could be classified as caused by a storm because the inundation was mainly local run-off from a downpour.
- Another town had flash flooding from local rivers that overflowed immediately.
- In Brisbane, damage was by flood because the Brisbane River overflowed some days after the storm (although waters released from the Wivenhoe Dam may come under a different part of the definition).

The legal position is that the onus of proof is firstly on the policyholder to establish that an insured event has occurred, then on the insurer to prove that an exclusion applies.

Industry concerns about the extent of their exposure to the flooding risk, a lack of consistent and reliable flood maps, the absence of mitigation, and concerns about the ability of policyholders to afford flood cover continued. In the early 1980s, the Northern Territory State-owned insurer introduced cover for flood and storm surge from the sea as standard in household insurance policies, although cover can be excluded on properties at high risk. The premiums charged are designed to cover the costs of these risks (with some cross-subsidies).

The Insurance Contracts Act (1984) introduced a statutory codification of general (and life) insurance contracts. Standard terms and conditions were prescribed for general insurance contracts, including home and contents insurance policies. Insurance companies are permitted to vary or exclude any

“standard cover” items provided they “clearly inform” policyholders; insurers have largely continued to exclude flood.

In 1989, the insurance industry established the Claims Review Panel (now part of the Financial Ombudsman Service). This Panel could review decisions on claims, including with respect to flood damage. The Claims Review Panel made determinations on the 1993 Benalla floods and the 1998 Townsville floods which brought more losses within the scope of the definitions of storm but did not lead to broad provision of flood cover. After the Wollongong floods in 1998, where community, government and media pressure led some insurers to make *ex gratia* payments, several insurers moved to widen their flood cover.

Despite efforts by the industry and government (the *Corporations Act* of 2001 introduced greater disclosure obligations by insurance companies), general confusion and contention by policyholders about what was included in flood coverage have been evident after every major storm or flood event. Attempts by the insurance industry to find a solution to flood insurance issues resulted in initiatives using different models in 1989-90, 1998-2000 and in 2004. Each attempt was unsuccessful because of competitive pressures, a lack of adequate flood maps, lack of government support, affordability and trade practices concerns.

Following controversy resulting from the Newcastle and Hunter Valley floods in 2007 the insurance industry proposed a common definition for “flood” and sought an exemption from the Australian Competition and Consumer Commission (ACCC) for what may otherwise have been anti-competitive behaviour. However, consumer groups opposed the move because the proposed wording would have limited coverage already on offer by some companies and the ACCC rejected the approach. The Insurance Council declined an invitation to put forward a modified flood definition.

Since the turn of the century, the trend for wider flood cover on policies has continued. The Insurance Council created the National Flood Information Database in 2007 and the information it contains has assisted insurers to price and provide flood cover. The industry estimates that 7% of properties are exposed to the risk of flooding and there is still a challenge to provide their owners with affordable cover; should full flood cover be offered to these properties, premium increases of hundreds of dollars per year could be

expected, rising to thousands per year for those at the extreme risk end of the spectrum. It is feared this would be enough to discourage owners from purchasing insurance, especially if excesses (deductibles) were in the thousands of dollars, which seems likely.

Small business proprietors have fared no better than homeowners in the supply of flood damage insurance in Australia. Although better able to have insurance cover tailored to their needs, they tend not to purchase flood cover, if the level of non-insurance evident after recent flooding in Queensland is a valid insight. Availability and affordability again are the obstacles. The latter seems to apply to all forms of insurance – a survey in 2008 found that 40% of small businesses did not have any general insurance at all.

In 2011, after widespread flooding caused devastating losses across the nation, the Commonwealth Government decided to involve itself again in the question of natural disaster insurance for individuals, small businesses and, indeed, governments. It established the Natural Disaster Insurance Review with terms of reference that included how to ensure that people at risk of flooding had access to insurance and benefited from mitigation strategies.

The review was to inform the newly adopted *National Strategy for Disaster Resilience* which outlined the shared responsibility of individuals, governments, businesses and communities in disaster preparation and response.

The scope of the review included the statement that government intervention in private insurance markets was justifiable only where, and to the extent that, there is a market failure. How to improve consumer awareness, claims handling and dispute resolution were all to be examined, as was the relationship between disaster mitigation measures taken by governments and the availability and affordability of insurance cover.

The review was published in September 2011. It recommended an integrated solution to the availability and affordability of flood insurance and identified five essential requirements that would need to be met by such a solution:

- All residential insurance policies need to include flood cover.

- Discounted insurance premiums are needed for properties in areas of medium and high flood risk, to render flood insurance affordable.
- A mechanism is needed to fund the discounts that are to be offered for affordability purposes.
- Insurers will need access to a government-sponsored reinsurance facility if they are to deliver flood insurance discounts without compromising their own commercial positions.
- National co-ordination of flood risk measurement and mitigation is needed for the benefit of the community and to ensure the development of a competitive market for flood insurance.

There followed some pivotal recommendations, presenting an integrated system:

- Create a Commonwealth Government agency to manage the national co-ordination of flood risk management and operate a system of premium discounts and a flood risk reinsurance facility, guaranteed by the Commonwealth Government.
- Require by law that all residential property insurance policies include flood cover, without compulsion to purchase and without cross subsidy by those with no flood risk.
- Introduce a system of premium discounts that makes flood insurance affordable for all.
- Have a Commonwealth Government guarantee of all claims under the reinsurance facility, recoverable from the state government in whose territory the flood occurred.

There was a recommendation covering small businesses, to oblige insurers to include flood cover as an opt-out extension on all small business package policies. In all, there were 47 recommendations, but the Panel declined to recommend either way on the taxation of insurance company catastrophe reserves (a matter with a long and unsuccessful history of lobbying by the insurance industry in the USA).

The review goes into some detail on the model of premium discounts supported by a central reinsurance facility. The Panel was anxious to leave the private sector market operating without interference, so ruled out direct premium subsidies.

The reinsurance pool would operate on an excess loss basis.¹² It would set its own premiums and discount these for flood prone cases in line with some measure of consumer affordability. Portions of individual policies would be ceded by insurance companies to the Pool, the insurance company being obliged to retain an initial amount (the "first loss").

The Pool's funds would comprise only its premium income and a Government guarantee would back it. It has been estimated that 70% of total claims will be funded by the taxpayer. Operational expenses of the agency that administered the Pool (and performed other functions) would be met by a fee on each policy ceded to the Pool, and the costs of additional functions like flood risk management activities would be met by the Commonwealth Government.

Government reaction to the Panel's report is awaited.

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2. Council of Australian Governments, 2011. *National Strategy for Disaster Resilience*, Commonwealth of Australia.
3. Trowbridge, John; Minto, Jim and Berrill, John, 2011. *Natural Disaster Insurance Review. Inquiry into Flood Insurance and Related Matters*, The Australian Government, the Treasury.

¹² This is effectively how EQC operates in relation to the insurance sector in New Zealand, by reason of the EQC "caps" on its coverage. It is also the basis on which EQC places its reinsurance protection in the global commercial market.

California: Earthquake

California confronted the availability of earthquake insurance for homeowners in a way that disrupted the whole residential insurance market, and then had to use another mechanism to correct this.

The California Earthquake Authority provides earthquake insurance to those who accept the statutory offer of supply and in this way, as in New Zealand, coverage is standardised. Also like the EQC in New Zealand, the CEA transfers some of its risk to the international markets.

The CEA provides examples of both pre- and post-funding of its earthquake claims liability. It is lately testing the effectiveness of an instrument that taps the capacity of the global capital markets. This provides an example of how the New Zealand Government might recover costs attributable to a disaster, or defray the liability it has to EQC, or to a reinsurance facility along the lines recommended by the Australian Natural Disaster Insurance Review.

The CEA's provisions in case its funding mechanisms are insufficient are also of interest. Like other schemes such as the Taiwan Residential Earthquake Insurance Fund, the CEA pays out *pro-rata* if funds are lacking, or it may pay claims by instalments.

Earthquake insurance has been a contentious issue in California for many years. The courts greatly influenced the provision of residential earthquake insurance when a decision in the 1980s deemed that homeowners' policies included damage by earthquake, whether they stated so or not, and despite express policy exclusions. The insurance industry response was to seek a law change to eliminate the clearly unintended basis of liability. In return the industry accepted a law that forced companies to offer earthquake damage cover on residential insurance policies, with acceptance at the discretion of the homeowner, accompanied by mechanisms to provide a record when the cover had been actively declined. The California legislature passed such a law in 1985 and the requirement has been part of the *California Insurance Code* ever since.

This was not the end of the legislature's involvement in the market. After the 1989 Loma Prieta earthquake, there was widespread dissatisfaction with the standard 10% policy deductible applied by insurance companies. The California State Government set up the California Residential Earthquake Recovery Fund (CRERF) to cover the estimated average residential insurance policy deductible; from 1992, homeowners were required to purchase US\$15,000 cover for a premium of between US\$12 and US\$60. In its first

and only year of operation, the CRERF paid out on sixteen events, leaving it in financial difficulty with US\$400 million in funds. The CRERF was discontinued because of administrative costs, claims handling costs and inefficiencies in settling the numerous small claims, and the potential political backlash in the event that claims could not be met in full (CRERF's provisions were that it paid *pro-rata* in the event of insufficient funding). The post of Insurance Commissioner in California is an elected one.

Until 1994, after every damage-causing earthquake in California, the legislature passed disaster assistance measures like tax deductions, postponement of payments and special valuations to reduce local body tax liability. The many uninsured homeowners created pressure for such moves and for special assistance. Thus the state's involvement in the relief of homeowners suffering earthquake damage was entrenched.

An outcome of the 1994 Northridge earthquake was a substantial increase in take-up rate of earthquake insurance and companies became concerned about the concentration of risk. Since insurers were forced by law to offer earthquake damage cover on their policies,

their only avenue was to stop writing homeowners' policies altogether, although most renewed existing covers.

Public pressure prevented the repeal of the law and in a fairly short time almost 90% of the insurance entities in the state had stopped issuing new policies. The flow-on effects on mortgage lending and the housing market were severe. It was decided that the state should intervene again to prevent the significant market failure that was developing. After discussions between the industry's largest players and the California Insurance Commissioner, a state-run earthquake insurance company was proposed.

Thus the rationale for the California Earthquake Authority (CEA) was to provide assistance to the residential insurance market to comply with the mandatory insurance law. The premise was that the CEA would cover the liability through its own separate policy that could be written as a companion to the insurance company policy of homeowners insurance. Companies that wished to take advantage of this had to become members of the scheme, both contributing substantial initial funds and committing to post-earthquake imposts after large events. Largely because of these initial and contingent costs, not all insurance companies participate in the CEA.

The CEA is a state-managed but privately financed organisation set up to provide a basic yet adequate level of insurance cover. From the outset, it was open to innovative funding ideas in order to become adequately capitalised. The initial plan was a combination of policyholder and insurance company funding, backed by third party reinsurance and financial derivatives. In this way, US\$10.5 billion was to be stacked up in a way that allowed CEA to operate on initial capital of only US\$800 million supplied by insurance companies. This, with retained earnings, comprises the capital of the CEA, which it is permitted to invest in fixed interest public and private sector securities. AM Best has rated the CEA's financial strength at A- (Excellent).

Commitments from the reinsurance market were obtained for US\$1.7 billion of cover over two years on an aggregated loss basis. This meant that accumulated losses over two years would not be reimbursed once these exceeded the cover amount. The premium was considered high at around a quarter of a billion dollars. Catastrophe bonds, at the time, were theoretical and none had yet been completed. In the event, the CEA's

planned bond did not reach the market because the reinsurance company Berkshire Hathaway wrote the whole layer as reinsurance.

When the CEA was launched, companies holding 72% total market share joined the scheme. The entire funding was therefore set at 72% of the target, US\$7.875 billion, which was still almost twice what the CEA's liability would have been for the Northridge earthquake.

The premiums and terms of the CEA policy were not as attractive to the consumer as they had been before the crisis precipitated by the Northridge earthquake, and the take-up rate was about half of what had been hoped for. The endorsement deductible meant that a house had to sustain more than 15% of its structure value in damage before a claim could be made, so protection was for major events only. Moreover, if the building has less damage than the 15% deductible, then no contents claim can be made either.

Although still offering its basic "mini-policy" in endorsements to suit homeowners, mobile-home owners, renters and condominium owners, the CEA now has several options for cover limits and deductibles. There are five sections, not all applicable to all policies, providing cover for the building (including an allowance to bring it up to current building codes), equipment and utility structures, personal possessions, temporary accommodation expenses (loss of rent cover for let properties) and loss assessments made by condominium owner associations.

The CEA cover is available only through the sale of a "companion" home or personal property policy in the private sector market. Participating companies issue the CEA policies and collect premiums on the CEA's behalf. All insurance companies that offer residential property insurance must still offer earthquake insurance on homeowners' policies and those participating in the CEA meet this obligation through the CEA policy. In return for this transfer of the obligation to bear the earthquake risk, the insurance company incurs a liability for both a pre- and post-disaster contribution to the funding and liabilities of the CEA.

The CEA covers earthquake damage only, not even extending to fire, tsunami or water damage caused by the earthquake (with some exceptions). Premiums are differentially rated using location, construction, foundation type and number of stories as elements in the formula. Cover is replacement value to the limit

in the companion policy. Several sub-limits apply to different sections of the cover. The property owner can now select a deductible of 10% or 15% of the insured value on the “companion” policy for the building cover, with deductibles also applying to other sections except temporary accommodation expenses. The CEA is constantly reviewing its product lines and will in 2012 launch “homeowners’ choice”, significantly adding to the choices available to policyholders.

Claims are dealt with by the participating insurance company that wrote the “companion” policy, with reimbursement or direct payment sought from the CEA. The participating company is paid a claims handling fee. The CEA has issued extensive training material and guidance on the handling of claims under its endorsements and maintains a degree of liaison and control with the participating insurance companies.

The CEA is not part of the state’s financial system, nor are its liabilities guaranteed by the State of California or the US Government. As an instrumentality of the state, the CEA pays no federal or state taxes.

The CEA receives about US\$600 million per year in premiums, much of which is used to pay for one of the largest reinsurance placements in the world. It is making efforts to reduce this cost, lately by setting up a classic catastrophe bond structure:

A special purpose vehicle (SPV) named Embarcadero Re has been formed in Bermuda, at arm’s length from CEA which did not establish it and does not manage it. CEA pays premiums to this entity in return for reinsurance cover. Embarcadero Re issues notes to capital market investors. Issue proceeds are passed to a Trust that invests in US Treasury Bonds. Embarcadero Re uses this interest plus premium income from the CEA to pay investors’ interest. In the event of a claim on the reinsurance, the CEA collects from Embarcadero Re which in turn receives money from the Trust Fund and investors’ eventual bond maturity proceeds are reduced thereby.

The basis of the reinsurance contract is indemnity, not a parametric trigger¹³ as in other bond issues, so the CEA is reimbursed for pay-outs within the terms of the agreement and has no basis risk (the risk that its actual pay-outs do not match the

catastrophe bond proceeds). The initial exercise is being considered a pilot and the issued bonds amounted to a modest US\$320 million. The CEA board has authorised an additional US\$300 million issue by 2013.

Through this “transformer” reinsurance arrangement, the CEA aims to diversify its risk away from the traditional reinsurance market to the much larger capital markets, reduce and stabilise its expenditure on risk transfer and obtain long-term protection by securing multi-year, fully collateralised protection¹⁴.

The funding structure of the CEA is:

Participating Company Assessments US\$2.36 billion	Ex-post payments by participating companies
Revenue Bonds \$0.32 billion	10 year bonds issued by the CEA
Risk Transfer US\$3.05 billion	Reinsurance and catastrophe bond
Capital US\$3.93 billion	Retained earnings, initial contribution from participating companies, investment income and the premium tax that CEA is not required to pass on to the state

Thus the CEA has approaching US\$10 billion of claims paying capacity. Losses would firstly fall to be paid out of capital until the risk transfer limits are reached. Revenue Bonds and Participating Company assessments would be resorted to only on the exhaustion of the first two layers.

If there were insufficient funds, claimants would receive *pro-rata* payment of claims, or the governing board could order payment by instalments.

The CEA now has over 800,000 policies in force. The CEA estimates this is about 70% of all the residential earthquake policies issued but still only 10% of homes in California have earthquake insurance so the success of the CEA in providing affordable earthquake insurance to homeowners has been modest. Most observers believe that CEA’s legally mandated actuarial pricing, coupled with its high risk-transfer costs and California’s last major earthquake in 1994 now receding from memory, make earthquake insurance an unattractive option for California residents. The CEA is holding its policy count, however, and is markedly increasing both its marketing efforts and its loss-mitigation activities and funding.

13 A parametric trigger is an arbitrary occurrence defined in the bond documents. An example is a magnitude 7.0 earthquake or above occurring within stated latitude and longitude measurements.

14 For more details of the bond issue see www.artemis.bm

The US Congress is considering allowing the Treasury to guarantee up to \$5 billion for post-event bonds issued by eligible state programmes. This would encourage other states in the USA to work with the private sector to create earthquake insurance schemes. In the CEA's case, post-event bonds could replace some of its reinsurance placement.

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2. The CEA, 2004. *"California Earthquake Authority Strategic Plan"*.
3. California Earthquake Authority web site, www.EarthquakeAuthority.com
4. World Forum of Catastrophe Programmes website, www.wfcatprogrammes.com

Florida: Hurricane

The provision of residential insurance in Florida is highly regulated as authorities attempt to ensure the insurance market has the capacity to cope with the demand for cover. Insurance of some perils must be offered (see reference to sink-hole damage in the UK subsidence case section), premium increases have to be approved, there is a state-owned insurer of last resort (Citizens Property Insurance Corporation) and a state-owned reinsurer to whom the passing of some of the catastrophe risk by insurance companies is compulsory. Even exiting the market is controlled by legislation.

The focus of this regulation is hurricane damage. Hurricanes have caused crises in the insurance market in Florida on several occasions, notably in 1992 when Hurricane Andrew was the catalyst for the formation of the Florida Hurricane Catastrophe Fund.

The structure is underpinned by the ability of the state-owned companies to fund losses by post-event levies on policyholders, insurance companies and the taxpayer. Post-event funding spreads the cost of disasters to future generations but when the risk is sufficiently remote and potentially serious, this is deemed justified. The danger is that, as in Florida, events may occur too frequently and the burden become great.

The Citizens Property Insurance Corporation (Citizens) is an example of a US FAIR (Fair Access to Insurance Requirements) Plan. The concept of these is covered in the next section along with more examples. A feature of the Citizens construct is its practice of selling back to the private sector shares in its policies, in order to dilute its market share.

The formal planning for post-event funding when required, and the different methods, could be applied in New Zealand to spread the risk of large natural disasters and provide the New Zealand Government with the means to repay emergency borrowing and to relieve it of having to build up large equalisation reserves.

The Florida Hurricane Catastrophe Fund (FHCF) was established as a direct result of Hurricane Andrew in 1992, at the time the most costly hurricane to strike the US mainland. About half the estimated cost of US\$30 billion was insured and the impact on the insurance industry was devastating. Eleven Florida insurance companies became insolvent. The state had uninsured losses of US\$4 to US\$14 billion. Thirty-nine people died and 63,000 homes were destroyed.

Reinsurance protection for companies with Florida portfolios was withdrawn or became expensive. Many insurance companies reacted by cancelling insurance policies; others declined to renew¹⁵. Faced with what seemed to be a mass exodus of insurance capacity for residential coverage, the Department of Insurance imposed a moratorium until November 1993 on insurance companies leaving Florida. It did this by limiting to 5% per annum the number of cancellations allowed at state level and 10% in any one county. The measure was accompanied by restrictive rules as to the size of the premium increases that could be imposed.

The state legislature then adopted a phase-out of the moratorium to the end of 1996 and established the FHCF as a trust fund administered by the state to provide a source of reimbursement to insurance companies for excessive losses due to hurricanes. The statutory provisions:

- required participation by insurance companies with a total exposure of greater than US\$10 million
- granted rule-making authority and tax-exempt status
- established procedures for setting and collecting premiums, and paying claims
- authorised the investment and disbursement of funds
- authorised the imposition and collection of emergency assessments
- authorised the issuance of debt secured by premiums and assessments
- required insurance companies to take on risk at set levels (i.e. accept a retention)
- provided for debt security if the Fund is terminated
- established an advisory council.

Subsequently the moratorium was extended but its requirements changed to ease the burden on insurance companies. The rules of the FHCF were also modified.

Also immediately post Hurricane Andrew, the Florida Residential Property and Casualty Joint Underwriting Association (JUA) was legislated with a mission to provide residential property insurance coverage for

property owners unable to procure it in the private sector. The JUA was merged in 2002 with another state entity that provided insurance cover for wind damage only, to form the Citizens Property Insurance Corporation.

Citizens is a state-regulated association that sells property insurance when it is not available from the private sector. It has tax-exempt status and runs three distinct accounts – personal lines for homeowners, commercial lines for condominiums and apartments, and coastal for properties at high risk, including a limited number of commercial businesses – an inheritance of the Windstorm Pool.

Citizens is the largest by far of the FAIR plans in the US, with some 60% of all policies written under these plans. Citizens has over US\$460 billion insured value on its books, reduced at first as a result of incentives for the private sector to take over some risk. Economic conditions have also seen a decline in new business. However two insurance company insolvencies in 2010, an exit from the market by other insurers and a relaxation of rules by the legislature have seen exposure increase once again.

When any of the three Citizens accounts goes into deficit, assessments on insurance companies are imposed and these can be passed on to policyholders. Assessments apply to all classes of business except medical malpractice, accident and health, and workers compensation, not only those that include hurricane damage.

A first assessment of up to 15% for each account in deficit (a maximum of 45%) is in the form of a surcharge on Citizens' own policyholders. If necessary, a Citizens Regular Assessment of up to 6% of premiums, or of the deficit in any account if greater, can be imposed on insurance companies and on policyholders whose cover is with non-licensed (surplus lines) insurers. If Citizens needs to raise debt to cover deficits, an Emergency Assessment can be levied on all policyholders, including its own. This can be the greater of up to 10% of either premiums or of the deficit in any account plus an additional amount to cover interest, fees and other charges related to the debt issue.

These mechanisms transfer the financing of Citizens' liability from pre-disaster (low premiums) to post disaster (the surcharges and bond issues). In doing so, they allow Citizens a competitive advantage over the private sector and enforces, through the premium surcharges,

¹⁵ It was not just the hurricane that caused this reaction. Having had their attention drawn to the state, insurers noted the population growth (and trend), rapidly changing demographics, escalating property values, legislative activity and better availability of information through advancing technology.

the funding of a part of any deficit by insurance companies. The balancing factor is that to qualify to be insured by Citizens, a property owner has to show that the best offer from the private sector exceeds the Citizens' premium by at least 15%. The effect of this restriction tends to be blunted by the regulator's reluctance to allow premium increases by private sector companies above the level of Citizens' charges.

Citizens incurred deficits in both 2004 and 2005, of US\$1.6 billion and over US\$2 billion respectively. A state appropriation of US\$715 million allowed the assessment on the market to be reduced from 11% to 2%. Assessments are due to continue until 2017.

In 2003 Florida legislated a depopulation plan for Citizens, designed to reduce the number of policies by encouraging the private sector to take over coverage. Insurance companies can spread their own risk by taking a share in the Citizens' portfolio either through a scheme that pays them \$100 per policy, payable over five years to prevent early cancellation once the "bounty" has been paid, or by taking on a proportion of the portfolio for the same proportion of the Citizens' premium. Initially successful, the depopulation plan has faltered in recent times. The 2004 and 2005 hurricane seasons created the circumstances for another insurance market failure in Florida and Citizens' policy count rose dramatically.

Legislation after the bad hurricane years significantly expanded the overall role of the state in the insurance market. Reforms in 2009 attempted to rectify this by, among other things, enabling Citizens to increase its premium rates by up to 10% per year.

Legislation that would have restored Citizens to its position as insurer of last resort by allowing significant rate increases did not pass the State Senate in 2011. A rise in subsidence claims¹⁶ had led to an increase in premium rates but Citizens' rating schedule is still not actuarially sound. New measures tighten coverage by placing a time limit on reporting hurricane and subsidence claims and redefining subsidence (sinkhole) losses.

For several reasons, although it is the insurer of last resort, today Citizens is the largest property insurer in the State (more than twice the size of the largest

private sector insurer) – and the largest contributor to the FHCF. These reasons include the need for private sector companies to obtain Department of Insurance approval for premium increases, with the regulator challenging increases above the rates charged by Citizens.

An insurance company is required to participate in the FHCF if it is licensed to transact insurance in Florida and it issues residential policies. This includes Citizens. The FHCF acts as a reinsurer. Each year participating companies choose a coverage option of 45%, 75% or 90% of all losses above their retentions. Each company's retention is a multiple of the premium it pays to the FHCF. If premiums collected are insufficient to pay losses, the FHCF may issue revenue bonds and make an emergency assessment on companies of up to 6% of their gross premium income. The State of Florida is not liable for any shortfall. To repay the bonds, the FHCF may impose a levy on premiums of up to 10%.

The FHCF grew to a membership of over 250 companies but currently it has fewer than 200 company members and a claims paying capacity of US\$17 billion, about half of which is composed of bond issuing and emergency assessment rights, in excess of the private sector's combined retention of US\$7 billion. These figures represent a 1 in 30 probability of occurrence.

In the early nineties the sizes of the FHCF and JUA exploded in response to the growing market failure. By 1996 their total exposure had risen to US\$180 billion. However several hurricane-free years (and improved hazard modelling) enticed insurance companies back to Florida and the exposure of the JUA, particularly, fell to a fraction of its peak.

The 2004 hurricane year forced a reappraisal by the insurance industry of the risk in Florida when there was a series of damaging hurricanes in the same year. One year later, Hurricanes Wilma and Katrina created havoc. Insurance companies once again massively reduced their exposure and loaded their premiums. In the face of a doubling of reinsurance premiums in five years, the FHCF raised the total coverage it could provide to the industry in any one year from US\$15 billion to US\$28 billion.

The billions of dollars that would be required post-disaster to reimburse Citizens' and the FHCF for a large hurricane – or bad hurricane season – has many Floridians concerned. The ability of the state to have a successful bond issue, especially in the current economic climate, is questioned as is the capacity of

16 All insurance companies in Florida are obliged by law to offer cover for "catastrophic ground cover collapse" that causes structural damage, and this includes Citizens. In 2010, Citizens' premiums for sinkhole coverage were reported as US\$32 million and claims US\$245 million.

policyholders to meet the surcharges of Citizens, the FHCF and the Florida Insurance Guaranty Association, another state agency set up to fund the claims of insolvent companies by levying other policyholders. Critics claim the system is not financially viable.

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USA: Fair Access to Insurance Requirements (FAIR) Plans

Since the 1970's several US mainland states have developed mechanisms or improved existing plans to ensure insurance coverage is available to homeowners living near the coast. These schemes are based on FAIR (Fair Access to Insurance Requirements) plans or beach and wind plans. One such scheme – Citizens Property Insurance Corporation in Florida – has already been described.

The plans differ to suit their particular challenges and the political realities of the state but all are designed to mutualise the risk of homeowners living in the most hurricane-prone areas. All the plans contain some method of post-disaster funding and some figure in the control of private sector premiums. Most plans purchase reinsurance cover and some have issued catastrophe bonds, or had them issued on their behalf by the state.

Some plans cover the whole state and others only the hurricane-prone coastal districts. Some of the plans have attempted to redistribute policies to willing insurance companies, with varying success.

Although not a FAIR Plan, the Hawaii Hurricane Relief Fund had the same aim of ensuring availability of insurance despite the market's withdrawal. It is included to bring attention to a unique feature: it is the only plan that has gone into abeyance. Although supposedly capable of reactivation, its funds are being depleted for use on projects of greater immediate priority.

Awareness of the concept of FAIR plans is useful when considering possible non-availability of disaster insurance in New Zealand or hazardous parts of the country, and some of the mechanisms and linkages with other state processes like taxation could prompt assessment here.

FAIR plans grew out of the social disorders of the 1960s, after which urban property owners sometimes found difficulty obtaining affordable insurance cover. To facilitate the recovery of the towns and cities badly affected, the US Congress passed the Urban Property Protection and Reinsurance Act. This enabled states

to set up FAIR Plans that required the participation of all licensed insurance companies in the state. They had to take a share of the exposure to riot damage insured by the plans but were originally protected from losses of catastrophic dimensions by reinsurance from the federal government. This reinsurance was never

needed and it lapsed in 1983. However, by then FAIR Plans were well established in many states and had been adjusted to address the more pressing problem of natural disaster damage. Some plans arranged their own reinsurance to protect participating companies from catastrophic losses and were equipped with powers to levy assessments on the insurance market (and, through premium increases, on policyholders) if the plan went into deficit.

Beach and wind plans also evolved in the 1960's in the states that had a bad experience of Atlantic and Gulf hurricanes since the Second World War, resulting in difficulties of access to affordable insurance by property owners. Most of the Atlantic coast states passed legislation setting up plans similar to FAIR Plans. In some states today, beach plans and FAIR Plans co-exist, the former applying only to coastal properties. In other states, the two plans have been amalgamated.

There are 35 state jurisdictions with FAIR Plans. The state governments rarely provide financial guarantees, although plans may issue debt on the state's credit rating. States also have guaranty funds in place to pay the claims of failed insurance companies. These claims are ultimately met by the rest of the insurance market and their policyholders, through assessments and premium levies.

Some FAIR Plans employ their own staff while others contract out to service carriers, who may perform underwriting, policyholder services and claim settlement functions.

Apart from Hawaii, which requires homeowners to insure against hurricane damage, no state has passed a law that homeowners must insure for property damage. However mortgagees normally make insurance cover a condition of a loan. The two federal mortgage agencies, Freddie Mac and Fanny Mae, make insurance against storm and hurricane damage, but not against earthquake damage, a condition of their loans. The state provides a last-resort insurer in the form of a FAIR Plan or beach/wind plan if a mortgagor is unable to find a company of acceptable claims paying ability willing to take on the cover. Property owners applying for cover from one of the plans have to submit to an inspection of their assets proposed for insurance and to comply with improvements suggested before insurance cover will be accepted.

The legislated mechanism usually enforces the participation of all insurance companies in the liability

underwritten by the state plan in proportion to their market share, with powers to levy members to fund deficits or bond repayments.

Although they were intended to serve only as a secondary source of coverage and – in most cases – to charge actuarially sound premiums to avoid deficits, many FAIR Plans have amassed major market shares and some states are actively trying to reduce their FAIR Plan policy numbers, either by incentivising private sector insurance offerings in hurricane-prone areas – for example with tax breaks – or selling back policies to the market in a process called “depopulating”.

Some FAIR Plans are described below. Note that, unless otherwise indicated, dollar figures quoted are US.

Alabama

Every insurer licensed to write essential property insurance or wind and hail coverage in the State of Alabama must join the Alabama Beach Pool, sharing its risks and being liable for assessments after a disaster. The extent of participation is governed by the member's market share but if this is higher in the Seacoast Territories, to which the Beach Pool is limited, than in the state overall, the company may be excused membership of the Pool.

The Alabama Insurance Underwriting Association (AIUA) operates the Beach Pool, which has two types of policy: one for fire and extraneous perils and the other for wind and hail damage. Cover is limited to sums insured of \$500,000 for dwellings and their contents, and \$1 million for commercial buildings and their contents. There is a limit of \$3 million at any one location. The premium structure is higher than the private sector market but encourages mitigation by offering a discount for dwellings certified by the Institute for Business and Home Safety as built or retrofitted to fortified wind resistant standards.

The legislation authorises the AIUA to assess member companies whenever there is a deficit, the sum not to exceed \$2 million per member. If these assessments are insufficient to cover the deficit, the AIUA may borrow additional funds, but cannot apply any more levies. Insurers can recoup their assessments from their policyholders through increased premiums.

The total insured value of the Beach Pool has increased markedly since Hurricane Katrina in 2005 and was \$3.7 billion at the end of 2011, with five times

the number of policies in force in 2004. For the 2011 hurricane season, the Beach Pool had a reinsurance layer of \$400 million with an excess of \$100 million. Members could buy down the deductible to their share of \$50 million if they wished and they could also share in higher layer of \$270 million excess of \$500 million.

A series of severe tornadoes hit parts of Alabama in April 2011. The tornadoes changed the focus of a special commission originally directed to look at the state's coastal insurance issues. Availability and affordability of homeowners' insurance is a rising concern given Alabama's exposure to tornadoes and hurricanes.

Louisiana

The insurer of last resort in Louisiana is the Louisiana Property Insurance Corporation, known as LA Citizens. Its Coastal Plan provides coverage in the area of the state most subject to hurricanes, and the FAIR Plan covers the remainder of the state. Both plans have a maximum sum insured of \$750,000. The deductible of 5% of the sum insured can be applied only once per hurricane season.

There are three types of policy, dwelling, homeowner and commercial. The first covers the dwelling and contents; the homeowner policy adds other structures, loss of use and medical payments.

Insurance companies are required to participate in both plans in proportion to their market share by premium income. Unlike its Florida counterpart, LA Citizens is not being driven to offer competitive pricing; on the contrary LA Citizens' premiums must be at least 10% above the private market.

LA Citizens pays its obligations out of its premium income and investments. It purchases a reinsurance programme of catastrophe cover, to pay 95% of losses above \$100 million, up to \$400 million.

If either plan is in deficit after any reinsurance recovery, LA Citizens can assess companies up to 10% of their premiums on assessable lines of business. If these assessments are not adequate to cover the deficit amount, LA Citizens can issue revenue bonds and declare emergency assessments to cover the repayment until the bonds are retired. Since 2007 there has been an emergency assessment ranging between 3.6% and 5.0% per year (3.9% in 2012). Insurers are allowed to recover these assessments from policyholders through a surcharge.

Hurricane Katrina (2005) struck Louisiana as a category four storm and left LA Citizens with a \$954 million deficit. LA Citizens issued revenue bonds and has imposed emergency assessments on insurers, which are due to continue until 2025. In 2006, \$56 million was made available from the state to reimburse policyholders who had been levied. Since then, levied policyholders have been eligible for a state income tax credit.

As was experienced by the Beach Pool in Alabama, the LA Citizens underwent a significant growth in exposures after Hurricane Katrina. In 2007, LA Citizens actively set out to reduce its policy count to below its pre-Katrina level. This has now been achieved as a result of an incentive programme to increase the availability of property insurance in the private sector. The terms of the existing programme under which insurance companies could buy back bundles of policies from LA Citizens were made more appealing and a bidding system was commenced. At the end of 2010, the two plans had about \$24 billion of insured exposure.¹⁷

Massachusetts

The Massachusetts Property Insurance Underwriting Association (MPIUA) was originally formed in 1968 to provide a FAIR plan for riot insurance. Today the Plan offers full homeowners coverage on a replacement value basis.

All companies writing basic property insurance in the state are required to participate in the plan. Cover is available for both residential and commercial property owners, including loss of rental. Limits on sums insured are \$1 million for residential property containing up to four units, and \$1.5 million for multiple buildings or locations, or including contents. Base deductibles of \$250, or \$500 for commercial premises, can be increased in return for premium discounts.

Before 2004, premium rates under the FAIR Plan were controlled by statute. The Plan could increase its rates only in line with private sector increases, which meant annual average rate increases of only 1% for several years. In 2004 this restriction was removed and from 2006 rates can be adjusted to a more actuarially sound basis. They went up an average of 12.4% in 2006 but the Insurance Commissioner denied the request for a rate increase for 2007.

¹⁷ At about the same time, EQC's exposure was about NZ\$190 billion, not including land values.

Under the Plan, the first \$250 million in losses must be funded by cash and short-term securities. On top of this is a layer of reinsurance, purchased for the first time in 2006. In 2009, the reinsurance programme provided \$900 million of cover. The next year the MPIUA negotiated a \$96 million catastrophe bond issue to protect it from hurricane losses through to 30 June 2013.

Company assessments in proportion to market share may be levied to fund any further shortfall and these may be passed on to policyholders.

The FAIR Plan has grown rapidly in the past decade because of the popularity for settlement in such places as Cape Cod, Martha's Vineyard and Nantucket. MPIUA's policy count has increased by 350% in the past twenty years and its exposure to loss has increased by a factor of nineteen. The FAIR Plan is the largest insurer of coastal properties in Massachusetts.

Results have been variable. Between 2000 and 2010, eight years produced a surplus and three a deficit.

Mississippi

Mississippi has two market plans that act as insurer of last resort for residential and commercial property owners: the Mississippi Windstorm Underwriting Association (MWUA) and the Mississippi Residential Property Insurance Underwriting Association (MRPIUA). All insurance companies are required to belong to these associations. They are funded by their premiums and assessments on the member companies to cover any shortfalls. Both associations may purchase reinsurance. The MWUA buys to its one hundred year probable maximum loss of \$772 million, with a \$15 million deductible and extensive co-insurance on some layers. The state contributes up to \$20 million per year towards the MWUA's reinsurance expense.

Company assessments in the event of a deficit in the pool are related to market share and since 2007 companies have been allowed to recover assessments by levying policyholders. Insurers may also obtain relief from state taxes if they are paying an assessment. After Hurricane Katrina, MWUA assessed its member companies for a total of \$545 million. The MWUA may issue bonds to cover deficits and policyholders state-wide may be levied to repay these.

The MWUA cover is available in coastal counties only, for sums insured up to \$1 million for one to

four family dwellings, and \$250,000 for contents. Commercial buildings may be insured for up to \$1 million per location. Premiums are risk-based. There is a deductible of at least \$500 depending on type of policy (dwelling, mobile home, commercial). Discounts are available for higher deductibles, including deductibles applicable only to damage from named hurricanes. Since 2009, the MWUA has been encouraging mitigation by homeowners through lower premiums.

The MRPIUA cover includes wind and hail damage for properties outside the coastal counties. Its limits are \$200,000 for buildings and \$75,000 for contents, with a deductible of \$500.

North Carolina

North Carolina has two long-standing residual market plans that act as insurers of last resort for residential and commercial property. One is the FAIR Plan operated through the North Carolina Joint Underwriting Association (NCJUA) to make basic and broad property insurance available to those unable to purchase cover in the private sector. This plan covers the whole state except for the barrier islands in the Atlantic.

The North Carolina Insurance Underwriting Association (NCIUA) operates a plan to provide cover for homeowners living in the eighteen coastal counties against wind and hail. This was called the Beach Plan but was changed to the Coastal Property Insurance Pool, or the Coastal Pool, in 2009.

All insurers writing property/casualty insurance in the state must participate in both pools.

Since Hurricane Katrina in 2005, the Coastal Pool's insurance exposure has risen some 60%, to about \$70 billion. Legislation in 2009 responded to concern over the dominant market share of the Coastal Pool and aimed to reinforce its last resort status. The state halved the maximum limit for a residential policy covering up to four dwellings to \$750,000. The limit for commercial properties is \$3 million, plus up to \$300,000 for business interruption. At the same time, the Department of Insurance introduced a rate differential provision that required rates to be 5% higher than those of the private market for wind-only coverage and 15% higher for the full homeowners' insurance coverage. The Department also increased the homeowner policy deductible and the amount of capital the Pool could retain.

The new legislation capped at \$1 billion in any one year the amount of insurance market assessment if the Pool is in deficit. Beyond this, residential and commercial property insurance premiums could rise by up to 10% to pay the Pool's claims.

The two plans have accessed capital markets for the past three years to provide reinsurance protection in the form of catastrophe bonds. Currently bonds for over \$500 million are extant. Thus, surcharges on policyholders could begin when the pool exhausts its surplus, reinsurance, and the \$1 billion that is not recoupable by insurance companies from their policyholders.

South Carolina

The South Carolina Wind and Hail Underwriting Association (SCWHUA), called the Beach Plan or Wind Pool, was enacted in 1971. It provides wind and hail only insurance for residential and commercial property in defined coastal areas. All companies offering property/casualty policies in the state are required to be members in proportion to their market share.

Insurers must include wind cover in all property insurance policies issued outside the coastal districts. Within these districts, insurers have the option to include the wind peril. If wind is excluded, the property owner can obtain it from the Beach Plan.

Assessments may be applied in the event of a deficit in the Plan after reinsurance recoveries. Insurance companies may recoup these assessments through premium increases.

The Plan has faced a doubling in policy numbers in five years and an increase in insured values from \$6.6 billion in 2005 to \$17.4 billion in 2010. In 2007, the state passed legislation designed to entice insurers to take a greater share of the coastal residential market. The enactment introduced a two-tier premium rating system in the Plan based on proximity to the coast, increased premiums by an average of 35% and also increased deductibles but allowed them to be bought down. Starting in 2008, Beach Pool policyholders are required to purchase flood insurance, which they can get from the National Flood Insurance Program.

Legislation in 2007 also allowed for tax incentives for people who make their homes more wind resistant, and tax credits for insurance companies that include windstorm losses in policies they issue in the coastal districts.

Residential Cover is capped at \$1.3 million for any one property. The legislation requires the Plan to adopt premium rates that aim to be self-sustaining.

Texas

The Texas Windstorm Insurance Association (TWIA) was established in 1971 after Hurricane Celia prompted many insurance companies to stop offering cover in coastal areas. The TWIA supplies wind and hail insurance for coastal property owners, as insurer of last resort. All companies licensed in the state must join the TWIA with participation in proportion to their market shares.

Cover is available for both residential and commercial property, including items such as signs, fences, swimming pools and flag poles. Monetary limits on cover are set by statute:

- Dwellings including contents – \$1.77 million
- Apartments, townhouses, condominiums (contents only) – \$374,000
- Mobile homes and contents – \$84,000
- Commercial buildings and contents – \$4.42 million

Residential policies also cover additional living expenses and commercial policies may include business interruption. The state law prohibits premium rate increases of more than 10% per year unless the Department of Insurance determines a higher rate due to catastrophic events.

The 2008 hurricane season caused a crisis in the TWIA. Not only were its funds depleted by two hurricane events, but thousands of lawsuits claimed delayed or denied pay-outs. New legislation passed in 2009 clarified the TWIA's role as a last resort insurer, established a growth plan for the TWIA's reserves, made \$2.5 billion available to pay for hurricane damage and repealed provisions that allowed for unlimited assessment of member companies. These assessments had been recoverable through taxation credits on premiums, potentially compromising the state's own revenues. The legislation also allowed for a more actuarially sound premium rating system.

The TWIA will fund its obligation to have \$2.5 billion available for claims through cash, reserves and a post-event bond issue for the balance. In 2011, TWIA purchased \$636 million of reinsurance which activates after losses exceed \$1.6 billion. Any further requirement

for funds will be met through bond issues, 70% paid for by premium surcharges on all policies issued in the coastal districts except federal flood, workers compensation and medical malpractice. The remaining 30% must be met by insurers, with no recourse to policyholders or taxation credits.

As in other coastal states of the USA, Texas has experienced dramatic growth in coastal settlement over the past two decades. TWIA's policy count has increased by a factor of 2.3 in the past decade and its exposure to building and contents loss by a factor of 4.

Hawaii

The Hawaii Hurricane Relief Fund (HHRF) was created as a state agency in 1993 following Hurricane Iniki. As with Hurricane Andrew in Florida, the reaction of insurance companies was to substantially reduce their writing of homeowners' policies. About half of Hawaiian homeowners had their cover cancelled or not renewed. Mortgagees in Hawaii require hurricane coverage on their security and the real estate industry noted a severe slow-down because of the non-availability of insurance.

The state made hurricane cover compulsory on homeowners' insurance and the HHRF provided a hurricane extension for participating insurance companies – much like the California Earthquake Authority. Insurance companies could decide whether or not to participate, but if they did then all their policies had to carry the HHRF extension. This prevented selection by the insurance company against the HHRF. The companies issued and serviced the policies and were to handle claims before seeking reimbursement from the HHRF.

The premiums charged by the Fund were used to purchase \$700 million of reinsurance cover on the global market. A levy on company insurance premiums of 3.75% was security for any revenue bonds issued. A charge of 0.1% of the principal on mortgage agreements was used to cover servicing and other overheads. A further charge of 1.5% of the total coverage provided by the HHRF was paid *pro rata* by participating insurance companies.

There was provision for post-event funding by raising the premium levy from 3.75% to 5.0% and applying a surcharge on these premiums of 7.5%. This was to bolster the security if the Hawaiian State Government issued revenue bonds of up to \$500 million to defray

the liability of the HHRF after a hurricane. All told, the HHRF had a financial capacity of about \$2 billion, which was sufficient for a repeat of Hurricane Iniki but insufficient for a Category Four strike on Honolulu.

The Fund was tax exempt.

The HHRF issued a residential insurance policy very much along private sector market lines, covering only the peril of hurricane damage. The original base rate of 1.75 *per mille* was later reduced to 1.49 *per mille*, and could be adjusted either way to take account of the wind resistant quality of the building.

No further hurricane activity was experienced in Hawaii after Iniki and insurance providers started returning to the market in 2000. In 2002, having paid no claims, the activities of the HHRF were suspended. The Fund remains dormant and, at least officially, capable of reactivation should insurance market failure again arise in Hawaii.

The case for returning remaining funds of about \$120 million to policyholders was rejected by the State Government on the basis that the monies were needed to reactivate coverage if necessary. However, several years ago the legislature began appropriating the interest on the Fund balance to pay for various social and other programmes, and over the past two years has taken significant proportions of the Fund's capital to balance the state budget. In 2011 legislation appropriated \$42 million from the Fund, following a \$67 million appropriation the year before. To replenish the Fund, the 2011 law provides an automatic mechanism to use general excise tax revenues in the next three years and to issue revenue bonds to maintain a \$75 million balance, the main purpose of which would be to purchase reinsurance to support another threatened market collapse after the next devastating hurricane in Hawaii.

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Glossary

ABI	Association of British Insurers
ACCC	Australian Competition and Consumer Affairs Commission
AIUA	Alabama Insurance Underwriting Association
CEA	California Earthquake Authority
Citizens	Citizens Property Insurance Corporation (Florida)
CRERF	California Residential Earthquake Recovery Fund
DEFRA	Department of Environment, Food and Rural Affairs (UK)
EQC	Earthquake Commission (NZ)
FAIR plans	Fair Access to Insurance Requirements plans (US)
FHCF	Florida Hurricane Catastrophe fund
HHRF	Hawaii Hurricane Relief Fund
JUA	Florida Residential Property and Casualty Joint Underwriting Association
LA Citizens	Louisiana Property Insurance Corporation
MPIUA	Massachusetts Property Insurance Underwriting Association
MRPIUA	Mississippi Residential Property Insurance Underwriting Association
MWUA	Mississippi Windstorm Underwriting Association
NCIUA	North Carolina Insurance Underwriting Association
NCJUA	North Carolina Joint Underwriting Association
PUPS	Previously Underpinned Properties Scheme (UK)
SCWHUA	South Carolina Wind and Hail Underwriting Association
TWIA	Texas Windstorm Insurance Association

