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# The California Earthquake Authority

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RESOURCES FOR THE FUTURE

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## Abstract

The California Earthquake Authority is a unique organization formed for a specific purpose. CEA owes its existence to a single earthquake just over 20 years ago and a 1980s-era state law: Without the 1994 Northridge earthquake and the offer of earthquake insurance required of sellers of home insurance in California, there would be no CEA. Because CEA's organizing genome is so particular—and because this paper is offered to help form a map to explore future reform and improvement of national catastrophe insurance programs—the following observations explain CEA as an entity. In that vein, the background of CEA is the first key: What happened, who did what, what alternatives were on the table, and why the the CEA was the chosen model. Without depth in those matters, there can be no useful or creative comparison of CEA to present or future states of other organizations. As well, after 20 years of operation, the CEA is no longer just a bright idea—it is a mature insurance provider with a broad portfolio of ideas: its market-leading insurance products, unique loss mitigation programs, and innovative financing techniques. As the largest and most active California player in addressing and mitigating both structural and financial residential earthquake risks, the CEA experience is instructive.


**Key Words:** California Earthquake Authority, earthquake insurance, California, disaster

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## 1. Introduction

After the 1994 Northridge earthquake caused massive, unexpected, and wholly unprecedented insured losses to residential properties in Southern California—after those severe losses led to an ever-worsening home-insurance crisis and market failure—and after two years of frustrating efforts to address the crisis and people's mounting concerns—the State of California in 1995 moved to solve the crisis when it created a first-of-its kind public instrumentality.

It was 1996 when the final enabling legislation, passed with declared urgency, took effect, and the California Earthquake Authority set off on its journey of—so far—20 years.

Although CEA as public instrumentality provides basic residential earthquake insurance throughout California in a voluntary insurance market, its declared, principal function was to restore the homeowners insurance market. Often termed "fire insurance" in home-mortgage-document requirements, homeowners insurance (unlike earthquake insurance) is required as a condition of obtaining and maintaining a home mortgage. Indeed, the title of principal CEA-enabling legislation was the *Homeowners Insurance Availability Act of 1996*.

But to imply that the California Legislature acted in 1995 and 1996 solely to save the homeowners-insurance market (anticipating impacts from home-insurance unavailability on California's massive residential real estate market) would be to imply that government cared little about earthquake coverages or didn't mind leaving Californians to fend for themselves the next time the Earth shook.

That was not the case: The reason there was a homeowners-insurance availability crisis was the effective refusal by the Legislature in 1995–1996 to consider removing California's

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* Marshall is general counsel for the California Earthquake Authority. The statements, views, and opinions in this paper are solely those of the author, who is the general counsel of the California Earthquake Authority. They do not necessarily express the views or official policies of the CEA or its Governing Board, or of the State of California.

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statutory "mandatory offer" of residential earthquake insurance, which had been in place since 1985[1] and was (and is) an unusual way to form an insurance contract.

A mandatory offer—by an insurer—of an earthquake insurance policy is unique to California:

- In a typical property insurance policy, the application by the potential insured is, legally, considered to be the contract "offer." If the insurer decides to accept the risk, it accepts the applicant's offer—and an insurance contract is formed.
- With California residential earthquake insurance, the insurer makes the insurance-contract offer and the applicant can accept it or not—this gives the applicant the power to form the insurance contract, which establishes coverage.

In their attempts to advance their vision of how to fix the paralyzed market caused by their refusal to sell new home-insurance policies freely, insurers strongly advocated repealing this mandatory-offer arrangement. But the Legislature, as strongly, insisted the earthquake offer continue, hoping to assure market availability. That basic standoff over mandatory-offer preservation set the stage for CEA.

For these reasons, CEA is a product, in part, of California's mandatory residential-earthquake-insurance offer. And that's also why CEA enjoys a unique market posture, since not a day goes by that California home insureds up and down the state aren't offered CEA quake coverage by their CEA-participating home insurers—which together represent about 80 percent of the California homeowners market. So, within the span of two years, effectively all such home insureds are presented with the opportunity and power to insure through CEA.

### *1.1. CEA as a Private-Market Actor*

CEA opened for business in December 1996, performing (as the law has it) "an essential state governmental function": providing residential earthquake insurance to owners and renters of residential property, who receive offers of CEA coverage from their residential insurers.[2]

[1] Offer is to be made upon inception, and biannually upon renewal, of the home-insurance policy.

[2] During its (roughly) first year of operation, CEA mostly received existing earthquake-insurance exposures directly from its initial participating insurers in "roll-overs" of outstanding policies (direct transfer to CEA of the insuring responsibility). Subsequently, however, participating insurers sent offers for CEA policies to new and renewal customers, reflecting CEA pricing (generally higher) and limits (lower).

- CEA provides earthquake insurance for owners or renters of houses or condominium units and for owners or renters of mobilehomes and manufactured homes.
- CEA is authorized to insure a residential structure of up to four dwelling units, so long as it is not used for a business or commercial purpose.

After some administrative adjustments to rates and rating territories in its first year or two of operations, and accounting for its unique operating attributes, including its public mission, CEA has generally acted in the manner of a private-market participant in California's voluntary (but regulated) market for residential earthquake insurance.

Created with an unusually high degree of independence and autonomy for a government-associated entity[3], CEA—when transacting its residential-earthquake-insurance business according to its statutory authority—does not operate as the government: It achieves its mission and purpose by operating for the government, and it does so without acquiring, consuming, or relying on any state money.

Indeed, this unusual status has proved a major factor in the CEA's improving its products far beyond minimum insurance attributes the law requires, raising available policy limits to levels meeting more customers' needs, and efficiently working concepts of earthquake-loss mitigation (retrofitting) into both stand-alone outreach and grant programs and significantly lower CEA-insurance premiums.

This self-sufficiency, made express in the CEA law, has two macro-economic-cum-legal effects of interest here, both intended: (1) It provides a plausible basis to the legal immunity of the State of California from responsibility for CEA's insured liabilities from earthquake damage to residences, and (2) it permits the CEA to operate without restraint as a competitive-market player and nonprofit insurance provider, whose customers select and contract freely with it.

### *1.2. Residential Property Insurance—California Style*

Residential earthquake insurance in California is offered and written, with direct reference to an unconventional statutory definition (described below), for California's version of personal lines property risks. These risks have in common an express "residential" component,

[3] The CEA Governing Board has plenary authority over all CEA finances and operations; CEA is essentially not part of California government's infrastructure.

but at least one defined coverage (residential structures of up to four dwelling units) is often written in California as a commercial coverage.

Commercial earthquake insurance in California—effectively, those policies not defined in law as “residential”—has no similar mandatory-offer scheme, and commercial earthquake insurance rates are not regulated. Customer take-up, on a statewide-average basis, is slightly lower than for its residential counterpart: under 10 percent of commercial properties insured for fire are also insured for earthquake.

Originally, CEA-policy sales arose from private insurers’[4] legally mandated offers of earthquake insurance to their residential-property-insurance customers, accomplished during the brief statutory-offer window. But for the past several years, and solely as a result of unilateral action by CEA, any participating-insurer customer—at any time, regardless of whether there is an earthquake offer from their insurer on the table—can request CEA earthquake insurance and be written a CEA policy. Such a “mid-term” request, historically, would have been turned down by insurers writing their own earthquake policies, for administrative convenience, perhaps, but also as a means of exposure control.

### *1.3. Unique*

There are a handful of state-sponsored, public catastrophe-insurance providers in the US, but other than FAIR Plans existing in many states (which provide high-risk residential coverages), the public catastrophe-insurance entities formed under state law cover wind exposures—in California only, earthquakes.

CEA is also unlike its counterparts around the world, virtually all of which outside the United States are created by federal governments and, typically, assisted or financially backstopped by those governments. An example is the New Zealand Earthquake Commission or “EQC.” Sometimes called a sibling of CEA and often assumed to operate like CEA, EQC is actually quite different:

[4] The CEA as a means of mandatory-offer compliance is only for those private insurers that elect—and meet any required financial-responsibility requirements—to participate in CEA.

- CEA is an entity created by and linked to a single US state; EQC is a "Crown entity," which means it acts as part of New Zealand's federal government.[5]
- CEA has no financial link to, and receives no funds or other financial backing from, the US federal government or California state government. By comparison, EQC's claim obligations are backed by an unlimited guarantee from New Zealand Treasury.
- The CEA is required by law to have actuarially sound rates, meaning that the full cost of the insurance provided must be recouped through the rates charged; actuarial soundness in that respect is often not required in other public catastrophe-insurance entities, including EQC.
- CEA operates as a provider of insurance, having been granted express authority by act of the California Legislature to transact the business of insurance, and issuing insurance policies resembling similar home/property policies in the United States. EQC does call its EQCover benefit "insurance," but EQC does not issue insurance policies and so doesn't run as a contract-based insurance company. Its program, of course, is consistent with New Zealand's own history, perils and hazards, culture, and social contract, and sprang from a pool of funds initially established during World War II to repair earthquake and war damage.

[5] An example of what New Zealand's EQC could do, operating in essence as a Crown entity providing a benefit program (rather than as an insurance provider operating under US state law and issuing a state-regulated insurance contract) is this: In the immediate aftermath of what became known as the Christchurch Earthquake Sequence—and for reasons generally thought good and sufficient—the New Zealand federal authorities made the executive decision that EQC would oversee the actual *repair and rebuilding* of many damaged properties rather than cash-settle those large claims. This step was clearly within government's authority, and with some claimed exceptions, the decision proved helpful and efficient. But were California facing comparable earthquake losses and widespread damage, and even assuming the presence of the same compelling economic and social reasons applied as in New Zealand, CEA and California quite likely would be legally bound to follow the CEA contract, which would dictate, among other things, cash settlements and not unilaterally imposed reconstruction.

**A Short History of EQC**

Over the years, the body now known as the Earthquake Commission (EQC), has undergone several metamorphoses, indicated by its various changes of name. It started life as the War Damage Commission, became the Earthquake and War Damage Commission and is now simply known as the Earthquake Commission.

The decision to cover earthquake risk, as well as war damage, which led to the formation of the Earthquake and War Damage Commission, was taken because of a need laid bare by the Wairarapa Earthquake of 1942. Unlike war damage insurance, earthquake cover was voluntary at the time and, as a result, most property was uninsured. Many buildings damaged in the quake had still not been repaired a year or so afterwards, largely because the owners couldn't afford to pay for repairs. The existence of a substantial war damage fund brought a demand for its use.

Various countries around the globe, other than New Zealand, also have public programs to respond to and compensate for catastrophes, some operating as reinsurers (e.g., Japan, Taiwan), some operating as multi-peril insurers (e.g., Spain, France), and some operating as single-peril insurers (e.g., Turkey, U.K.). CEA shares some traits and purposes with all the foregoing, but it is essentially different from those entities, too.

### *1.4. This Paper*

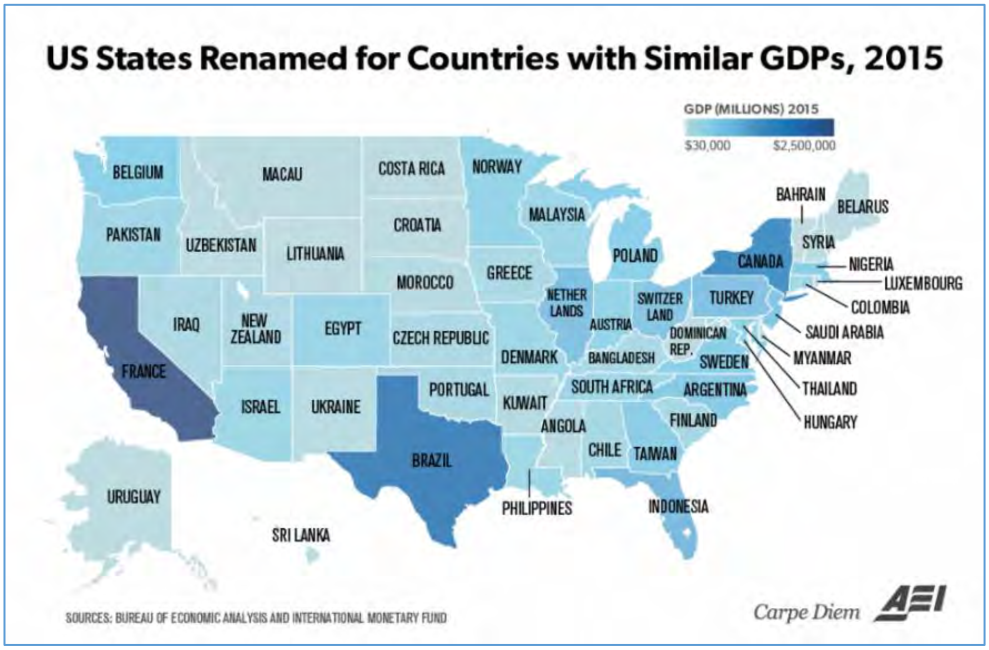
This paper will explain that CEA's existence and operational direction stem from a unique-in-the-United States, only-in-California, insurance-market characteristic: imposed by law, the mandatory offer of residential earthquake insurance. CEA—then and now the sole public, nonprofit provider of residential earthquake insurance in the United States—is by far the dominant California-market player operating under that 30-year old regulatory regime.

The granularity provided for source material here is offered both for the public record and to facilitate its use by those who wish to leverage and use an in-depth look at CEA, and its back story and legal and historical underpinnings, to inform future models of public catastrophe-insurance organizations.

## 2. California Residential Earthquake Insurance, the Northridge Earthquake, and the CEA

If California were a sovereign country, it would be the sixth-largest national economy in the world.[6] Newsweek magazine in 2015 said that California would be “France”[7] (see Figure 1).

**Figure 1. US States Renamed for Countries with Similar GDPs, 2015**




*Source*: American Enterprise Institute via Newsweek

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[6] The Mercury News (July 5, 2016):

> *New data from the World Bank show that California’s economy was equivalent to the sixth largest in the world last year. The World Bank’s annual rankings of countries’ gross domestic products, released on Friday, confirm an analysis published last month by the California Department of Finance. The US Bureau of Economic Analysis reported last month that California’s GDP was $2.5 trillion in 2015, up 4.1 percent from a year earlier.California saw more economic growth than the United States as a whole, which was up 2.4 percent.*

According to the California Department of Finance, which used data from the International Monetary Fund and the US Bureau of Economic Analysis, California’s “worldwide ranking” actually improved in 2016 over 2015, from eighth to sixth. California’s rate of economic growth almost doubled that of the US as a whole: California grew year over year by 4.1 percent in 2015 compared to the national economic-growth rate of 2.4 percent. (The Sacramento Bee (June 14, 2016)).

[7] Newsweek.com (June 11, 2016).

At its current (and growing[8]) population of over 39 million, California would be the 35th most populous nation. And those 39+ million people live in over nine million households in the Golden State.

California also has two-thirds of the US's earthquake risk—and despite the ever-present threat of serious and damaging ground-shaking (Alaska has the most earthquakes per year in the US by sheer numbers, but California has the highest number of *damaging* earthquakes in the US[9]), only about 1.15 million of those owned or rented California households have any earthquake insurance.[10]

By the numbers, clearly, California householders simply aren't well earthquake-protected, at least in a financial sense through the mechanism of earthquake insurance. Taking into account the more than 11.2 million home-insurance policies in force in California in 2015, and the 1.15 million residential earthquake policies in force, at December 31, 2015, there was a statewide take-up rate of 10.23 percent.[11]

Even taking into account that the 10.23 percent number is an average across lower- and higher-risk areas of the state, and that by the same token people in certain high-risk California regions buy earthquake insurance at differing rates of take-up, a number of Californians clearly have chosen to self-insure. Or, if self-insuring is by its true nature an act that requires combining prudential financial planning and either substantial savings or substantial wealth with the choice not to buy insurance, it might be more reasonable to conclude that a number of Californians have simply chosen not to insure…and not to prepare, financially, for the next damaging earthquake.

## 3. Legal Background: Residential Earthquake Insurance in California

Residential earthquake insurance[12] has been available in California for many years, but since the mid-1980s California law has required insurers that sell residential property insurance[13]

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8 Based on US Census Bureau reporting, California is 17th among US states in five-year rate of population growth, at 5.08 percent.

9 United States Geological Survey (Earthquake Facts & Earthquake Fantasy).

10 California Department of Insurance (*EARTHQUAKE PREMIUM, EXPOSURE AND POLICY COUNT DATA CALL - SUMMARY OF 2015 RESIDENTIAL MARKET TOTALS*).

11 *Id.*

12 Insurance for houses, mobilehomes and manufactured homes, condominium units, renters of apartments and houses, and some smaller residential structures such as duplexes, triplexes, and four-plexes.

to make what is commonly known as a “mandatory offer” of earthquake insurance to new and existing customers.[14] As a condition to selling (or, biannually, renewing) a policy of residential-property insurance (as defined) in California, the insurer must offer earthquake insurance on the insured property.[15] The offer must state the proposed dwelling, contents, and additional living expense limits; the deductible, and the estimated annual premium.[16]

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[13] The California Legislature’s definition of “residential” properties does not follow the typical US insurance-industry taxonomy, which generally divides insurance into business or business-like enterprises (“commercial lines”) and individuals in their non-business capacities (“personal lines”). The entire US insurance market comprises about 50 percent commercial risks and 50 percent personal-lines risks.

This formulation of earthquake-insured risks expresses a public policy that insurance-industry constraints should be overridden for the important-to-California risk of earthquake, to assure that certain California property owners and renters—without fail—will have access to earthquake insurance by use of an offer which they are free to accept or reject.

Whether an insurer calls a property risk commercial or personal lines can have significance under California law: California closely regulates premium-rate-setting and market behavior for personal-lines property policies. [See, generally, the statutory result of California Initiative Proposition 103, which added Article 10 to Chapter 9, Part 2, Division 1 of the California Insurance Code. Proposition 103 first required a rollback of certain insurance rates, and, ongoing, a system of close rate and market regulation, public participation, and required rate approval of several important types of consumer insurance.] *NOTE: References to the “Insurance Code” in this paper are to the California Insurance Code, unless otherwise stated*.

Important to this discussion is the legal requirement of an earthquake-insurance offer to applicants for, and policyholders of, residential property insurance, as defined for “*individually owned residential structures of not more than four dwelling units, individually owned condominium units, or individually owned mobilehomes, and their contents, located in this state and used exclusively for residential purposes or a tenant’s policy insuring personal contents of a residential unit located in this state. “Policy of residential property insurance,” as defined, shall not include insurance for real property or its contents used for any commercial, industrial, or business purpose, except a structure of not more than four dwelling units rented for individual residential purposes. A policy that does not include any of the perils insured against in a standard fire policy shall not be included in the definition of “policy of residential property insurance.*” Insurance Code section 10087, subdivision (a).

[14] Made part of California law starting in 1985, the offer is made upon policy inception and every two years thereafter. See: Insurance Code section 10081 and following. [*NOTE: The statutorily required wording of the mandatory offer of earthquake insurance was substantially amended to make it clearer and more accurate in 2014 legislation supported by United Policyholders, the Personal Insurance Federation of California, and the California Earthquake Authority*.]

[15] The history was explicated in an analysis published by the Senate Rules Committee of the California Legislature, in connection with the legislative consideration of AB 1366 (Knowles - 1995):

Besides California, only one US state imposes any sort of requirement that insurers offer earthquake insurance to residential customers: Kentucky has a regulatory "preference" that an earthquake-insurance offer be made regularly[17] in connection with the sale of homeowners insurance (but has no legal requirement so providing).

There are no state-law mandates of which the CEA is aware, including in California, that require an offer of a policy of earthquake insurance to *commercial* risks.[18] It is CEA's understanding, however, that some lenders financing commercial construction or purchase in seismically active areas may require some level of earthquake insurance, possibly limited to periods when a building is in a construction phase during which it is more susceptible to damage from ground movement.

Under California's residential-property-insurance mandatory-offer system, consumers are not required to buy earthquake insurance, but they must be offered the opportunity to do so. In other words, the legal mandate applies solely to the offer of a policy—not to the acceptance of that offer.

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*In 1984, in AB 2865 (McAlister), the Legislature enacted Insurance Code Section 10088 to abrogate the doctrine of concurrent causation as it applies to insurance losses caused by earthquake. Section 10088 provides "...no policy which by its terms does not cover the peril of earthquake shall provide or shall be held to provide coverage for any loss or damage when earthquake is a proximate cause regardless of whether the loss or damage also directly or indirectly results from or is contributed to, concurrently or in any sequence by any other proximate or remote cause, whether or not covered by the policy."*

*The repeal of the concurrent causation doctrine was linked to a new requirement that insurers must offer earthquake coverage on residential properties. In the same legislation, Section 10081 was enacted to require all insurers that sell residential property insurance to offer earthquake insurance coverage to its insureds. This "mandatory offer" requirement may be satisfied by issuance of an endorsement on the homeowner's policy or issuance of a separate policy covering earthquakes.*

This legislative history summarizes the primary reason there is a mandatory offer of earthquake insurance to residential property insurance applicants and policyholders: a desire by insurers to avoid having to pay claims for earthquake shake damage under a homeowners policy—even such a policy with an earthquake coverage exclusion—whose exclusions had been imperiled in litigation.

[16] Insurance Code section 10083, subdivision (a), paragraphs (1) and (2).

[17] Information obtained by CEA from the Kentucky Department of Insurance.

[18] A commercial earthquake-insurance policy is sometimes called a "difference in conditions" policy—a multi-peril insurance-contract form that covers conditions not included in a standard US business policy. The International Risk Management Institute defines a difference in conditions policy as, inter alia, "[a]n all risks property insurance policy that is purchased in addition to a commercial property policy to obtain coverage for perils not insured against in the commercial property policy (usually flood and earthquake)."

From a legal standpoint, California's mandatory-offer law confers a unique privilege on a potential residential-quake-insurance customer: the opportunity to receive an irrevocable offer in the first place, required by law of the insurer, and the opportunity to accept that offer and bind coverage:

- In the normal course[19] of virtually any insurance transaction, the applicant submits an application and conveys that offer to the insurance company, directly or through an agent. The applicant is the "offeror," in legal terms.
- If the insurer wishes to take the risk of insuring the applicant, it conveys its acceptance of the applicant's offer, which makes the insurer the "offeree."
- Under a basic principle of contract law, the offeree has the power to create a contract by acceptance of the offer,[20] for so long as it is open.
- So California's unique mandatory-offer law for residential-property risks in California stands the normal insurance-contract formation on its head: In California, the home-insurance policyholder binds the earthquake-insurance contract, not the insurer.

How does this help with understanding residential earthquake insurance in California? First, residential earthquake insurance in California is historically and solely available in a voluntary market, and the only legal mandate is that insurers must make the offer. No lender and no law requires its purchase. Second, with residential-earthquake-insurance take-up in California hovering around 10 percent statewide, it is apparent—despite pockets of higher take-up in discrete locations in the state[21] and despite their legal power of controlling an irrevocable contract offer—that most Californians in 2016 who buy home insurance aren't buying much earthquake insurance.

But the existence of this California mandatory-offer construct, with its key "insurer-as-offeror, applicant-as-offeree" feature, is clearly expressive of a public policy—again, unique in the US—that might be stated as, "In California, insuring a home for earthquake is important

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[19] See, for example, "Essentials of a Valid Insurance Contract."

[20] See, for example, a century-old article from the Yale Law Journal: "An offer is an act on the part of one person whereby he gives to another the legal power of creating the obligation called contract. An acceptance is the exercise of the power conferred by the offer, by the performance of some other act or acts. Both offer and acceptance must be acts expressing assent." Page 171.

[21] Source: California Earthquake Authority.

enough that the choice to do so belongs—with certain conditions—to the policyholder, not the insurer." So what sort of effect has this evident public policy—which periodically shines a light on the ability of a householder to buy earthquake insurance to provide financial security and family protection—had on consumers' market behavior?

## 4. Historical Pricing Considerations for California Residential Earthquake Insurance

Observers have expressed anecdotally to CEA from their observations at the time that insurers historically—pre-Northridge—did not well understand how to price the residential earthquake policies they sold, even in the face of a mandatory-offer system that virtually guaranteed insurers would have earthquake risk in their insured portfolios. In other words, despite facing forced acceptance of catastrophe risk they could not rid themselves of merely through careful or restrictive underwriting[22], they were unsuccessful in risk-based pricing.[23]

[22] Insurance Code section 10089, which was added to the Insurance Code and became effective in the post-Loma Prieta earthquake year of 1990, was in effect at the time the Northridge earthquake occurred. In its original form, Section 10089 permitted no mini-policy; although its wording was brief and general, insurers tended to write earthquake policies at the same limits and providing the same coverages as they did with their policies of residential property insurance.

Assembly Bill 1366 (Knowles - 1995) amended Section 10089 to authorize insurers to offer the low-limits, restricted-coverage "mini-policy" to their home-insurance customers. The CEA initially sold only a mini-policy, but it did not invent it.

[23] It's an open question whether, or to what extent, California's (then new) Proposition 103 rate-rollback and regulation law played in such pricing decisions: For half of the decade between passage of the mandatory-offer law and the Northridge earthquake, California insurers operated under the McBride-Grunsky Regulatory Act of 1947, a non-intrusive insurance rate-regulation law aimed at fostering competition, but for several years immediately preceding Northridge, Proposition 103 was in effect.

One seasoned legal commentator noted, "California has one of the most rigorous, active, and thorough insurance rate regulatory systems in the country. The current system…represents a complete overhaul of the previous "open competition" system in existence since the 1947 enactment of the McBride/Grunsky Act. The 1988 voter initiative Proposition 103 replaced that system with "prior approval" rate regulation. Under Proposition 103, an insurer must apply for and obtain the insurance commissioner's "prior approval" before charging a changed rate." Univ. of San Francisco Law Review, Vol. 44, page 853. [Additional legal citations omitted.]

So were insurers unable to price according to known, modeled risk, or were they perhaps lulled by a largely profitable earthquake-insurance business into being less than optimally informed?

Years of effective inattention and “competitive” rating (in which pricing goes down when market appetites of sellers goes up, and underwriting is relegated) resulted arguably in insufficient premium being charged and collected for the risks insured.

## 5. The 1994 Northridge Earthquake

On January 17, 1994, at 4:31 a.m. Pacific time, a magnitude 6.7 earthquake[24] struck California’s San Fernando Valley, 20 miles northwest of downtown Los Angeles.

While the strong ground-shaking lasted only 20 seconds, the earthquake produced enormous ground acceleration which resulted in loss of life and severe damage. From this devastating event, 33 lives were lost, 8,700 persons were injured, and residential insured losses exceeded $12 billion, making it one of the costliest natural disasters in US history.

As insurers scrambled to assess their unprecedented, huge Northridge insured losses, their representatives in Sacramento lobbied intensely, seeking to repeal the mandatory-offer law. Insurers told lawmakers and the regulator they wanted to stay in the California homeowners-insurance market, which was mostly profitable and well understood, but California earthquake risk was too high and too poorly understood. It threatened company profitability, ratings, and (in extreme cases) solvency.

While a minority of lawmakers acted in sympathy and support of those concerns, most legislators were worried that a flat repeal of the mandatory offer could quickly end residential-

[24] A “6.7 earthquake” is expressing a seismic characteristic in a common way. But people commonly don’t understand how the logarithmic Richter Scale works. When Charles Richter developed his “Richter Scale,” he sought primarily a way to compare earthquake sizes. Earthquakes, felt or unfelt, trivial or great, vary tremendously from each other in size, necessitating a logarithmic scale for convenience.

A Richter 6.7 earthquake such as Northridge 1994 would have a measured amplitude 10 times greater than a 5.7 earthquake. But the 6.7 earthquake would release about 31 times more energy than the 5.7.

But the Richter Scale does not express earthquake *damage*—expressing damage requires understanding and expressing *intensity*. The scale of intensity used in the US is the Modified Mercalli Intensity (MMI) Scale. The MMI scale is expressed in 12 increasing intensity levels, ranging from imperceptible shaking to catastrophic destruction. It uses Roman numerals (I through XII), and it has no mathematical basis—it is an arbitrary ranking based on observed effects.

Intensity is generally greater toward an earthquake’s epicenter. Northridge had a maximum MMI of IX, which signifies, “Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.”

earthquake-insurance availability, at least until the voluntary market for it returned. The possibility that new homeowners-insurance policies—a universal necessity of mortgage lending, the leading support of the home construction and real estate industries—could become unavailable became a ticking time bomb, threatening direct and serious impacts on California residents.

John Garamendi, insurance commissioner when Northridge occurred, tried unsuccessfully for the remaining year of his first term in office[25] to convince insurance-industry representatives to consider participating in a facility of his team's design. Insurers were beginning to restrict severely the sale of new home insurance in order to avoid having to take on earthquake risk.[26] Commissioner Garamendi also attempted to use the California FAIR Plan[27] to combat the market effects,[28] issuing an emergency order, effective July 1, 1994, extending sale of FAIR Plan insurance to California as a whole and ordering FAIR Plan to prepare to sell a standalone earthquake policy.[29] Insurers' selling restrictions, including refusals to sell, eventually reached some 94 percent of the home-insurance market.

Continuing its intense interest in and response to this residential-property insurance market crisis, the California Legislature in 1995 began considering the CEA framework[30], but

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[25] As a part of Proposition 103, passed by California voters in 1988, the statutory office of California insurance commissioner was changed from an appointed position to an elected one with a four-year term (not to exceed two four-year terms).

[26] The market constriction, later loosely termed by some a market failure, applied only to "residential property insurance," since that was (and is) the sole category of insurance subject to mandatory writing of earthquake insurance upon an accepted coverage offer. Commercial coverages were not a part of any of this, since then (as now) commercial coverage for earthquake is sold in a market largely free of Proposition 103 rate and other regulation—if an insurer does not wish to write commercial earthquake insurance, it need not, and there is no legal requirement to write or offer such coverage.

[27] Description of California FAIR Plan. FAIR Plan associations were authorized by Congress in 1968.

[28] Under Insurance Code section 10091, subdivision (c), the California insurance commissioner may designate the geographic or urban areas where FAIR Plan insurance will be sold.

[29] In September 1995, new Insurance Commissioner Chuck Quackenbush continued in place his predecessor's July 1994 emergency order, until May 1996, when he rescinded it.

[30] To understand the CEA as the solution the California Legislature ultimately selected, it is enlightening to know competing legislative proposals in 1995 and 1996 to address the ongoing market crisis in homeowners and residential-earthquake insurance. They were (excluding CEA-related proposals):

- SB 58 (Lewis–R): To relieve insurers of the mandatory offer of earthquake insurance unless the federal government instituted a backstop to "adequately insure losses" from quakes. *Did not pass*.
- SB 64 (Rosenthal–D): To liberalize income-tax deduction for uncompensated (Northridge) earthquake losses. *Did not pass*.

- SB 395 (Rosenthal–D): Directed Department of Insurance to furnish grants and loans for retrofitting high-risk dwellings of low- and moderate-income households to “reduce the costs of residential earthquake insurance.” This program allocated unused funds from the CRER Fund (See: Footnote 31) and expired after four years. *Passed*.
- SB 464 (Rosenthal–D): Would limit home-insurance cancellations and nonrenewals if caused by damage from recent “natural disasters.” *Did not pass*.
- SB 592 (Alquist–D): Would speed up depreciation of costs of home retrofitting, making tax benefits from retrofits more immediate. *Did not pass*.
- SB 879 (Senate Committee on Insurance (Rosenthal–D, Chair): Authorized Department of Insurance to bolster funds of California’s insurance guaranty association, which steps in to pay claims of insolvent insurers. The bill was specifically aimed at ameliorating effects of insolvencies caused by earthquakes. *Passed*.
- SB 882 (Rosenthal–D): Formed voluntary (on part of insured), pilot mediation system to resolve Northridge insurance claims more expeditiously. *Passed*.
- SB 1114 (Hayden–D): To require California FAIR Plan to offer standalone policy of residential earthquake insurance. *Did not pass*.
- SB 1246 (Hayden–D): Would have effectively, legislatively reversed court decisions that found concurrent causation by two causes of loss, one covered by an insurance policy and the other excluded. *Did not pass*.
- SB 1327 (Johnson–D): The Federal Home Loan Mortgage Corporation (“Freddie Mac”) adopted an earthquake-insurance requirement for certain California condominium projects. The requirement would use “earthquake risk assessments.” In order to slow or curtail imposition of this requirement, which the Legislature wished to oppose, it passed this legislation on an urgency basis, requiring state-supervised approval of assessment methods. *Passed*.
    - Some observers comment that California, given its severe earthquake risk, should require earthquake insurance for residents. In this case, Freddie Mac attempted such a requirement, but on a limited basis. The state acted to slow the imposition, and Freddie Mac eventually withdrew it.
    - The CEA law requires (see Insurance Code sections 10089.36 and 10089.54) certain actions—up to and including terminating the CEA’s existence—if Freddie Mac or Fannie Mae, or both, act to impose earthquake-insurance requirements on mortgaged California residential properties.
- SB 1623 (Rosenthal–D): Unsuccessful effort to form, essentially, a state- and locally funded reinsurance fund to backstop the private insurance industry. In findings, the bill provided, “The insolvencies and financial impairments resulting from…the Northridge Earthquake demonstrate that many property insurers are unable or unwilling to maintain reserves, surplus, and reinsurance sufficient to…pay all claims in full in the event of a major natural disaster….” *Did not pass*.
- SB 1858 (Rosenthal–D): Would have awarded FAIR Plan participation advantages to insurers writing earthquake insurance in California’s “Seismic Zone 4” (where a property has a 1-in-10 chance that an earthquake with active peak-acceleration level of 0.4 g will occur within next 50 years) (USGS on modern disuse of seismic zones here). *Did not pass*.
- AB 160 (Baca–D (now an R, although no longer in Legislature)): Would have reestablished and re-funded the CRER Fund (See: Footnote 31). *Did not pass*.
- AB 1627 (McDonald–D and Murray–D): Would have required the California FAIR Plan to write a standalone residential earthquake insurance policy and buy reinsurance to support its earthquake exposure. *Did not pass*.
- AB 1670 (Takasugi–R): Would have further softened the tax bite of early retirement distributions if the funds were used to repair Northridge earthquake damage. *Did not pass*.
- AB 1754 (Knowles–R): Made changes to FAIR Plan policies in attempt to limit the Plan’s exposure to earthquake and prevent a claimed withdrawal by participating companies from Plan participation. One analysis of the bill (at page 4) noted that “[a]s of January 10, 1996 the Fair Plan [sic] had 45,282

the concepts were so different from any earlier approach in California to earthquake exposure,[31] initial legislation imposed three extraordinary conditions on CEA's becoming operational:

1. Insurers representing 70 percent of the residential-property-insurance market in California would have to irrevocably commit to CEA participation. That

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earthquake policies in force with a total exposure of over $11.3 billion. This represents about two percent of market share, which is double the market share from one year ago." *Passed*.

- AB 1838 (Figueroa–D): Would have redefined "earthquake" in residential earthquake policies for purposes of preventing the application of more than one policy deductible for a single event. *Did not pass*.
- AB 2292 (Knox–D): Would have limited ability of local governments to increase property taxation through early re-assessments of Northridge-earthquake-damaged residences. *Did not pass*.
- AB 3237 (Knowles–R): Would have limited notice to policyholders about their ability to obtain residential earthquake insurance and curtailed insurers' requirement to send a related notice and offer. *Did not pass*.
- AB 3439 (Sweeney–D): Would have increased the set-aside of CEA investment income (used by CEA for earthquake-loss mitigation loans and grants) from five percent to ten percent per year. *Did not pass*.
- AJR (Assembly Joint Resolution) 23: Complained in an unsuccessful joint resolution that, "[a]dditional earthquake insurance requirements for condominiums recently announced by FREDDIE MAC [sic] are unduly burdensome, unworkably expensive, and ignore insurance capacity difficulties of the California market; and … [t]he insurance scheme imposed by FREDDIE MAC will precipitate an enormous number of defaults in California loans, effectively destroying the equity held by thousands of California homeowners and amounts to de facto redlining of California urban centers." *Did not pass*.

[31] Case in point: The October 1989 Loma Prieta earthquake, epicentered in the Santa Cruz Mountains and which caused extensive loss of life and public- and private-property damage in and around the San Francisco Bay Area, prompted the California Legislature to enact a kind of "insurance" program: the California Residential Earthquake Recovery ("CRER") Fund, which operated but a single year, from January 1, 1992, to December 31, 1992.

- Program participation was *compulsory* for all owners of California homeowners policies. The Department of Insurance was tasked with program administration. The author of this paper acted as CRER Fund legal counsel.
- The maximum program benefit of $15,000 in cash, assessed by hired loss adjusters paid a flat fee and scaled to pay an average earthquake insurance deductible in the day, was funded solely by surcharges of between $12 and $60 per year on all home-insurance policies.
- The program did not issue an insurance contract—it was a government- granted benefit with an average beneficiary retention of only about $1,100.
- Insurance Commissioner John Garamendi argued that CRER Fund was a revenue-only program that purported to "insure" residential risks against catastrophes, but it had no surplus and very limited reinsurance—the program, he insisted, was per se insolvent. Ultimately, the Legislature agreed, voting to repeal the CRER Fund as of year-end 1992.
- Mr. Garamendi was prescient: Given the flat-fee CRER Fund paid for each claim adjustment, the cost of adjusting Northridge residential claims could have drained the program—perhaps without its having paid a single claim.

participation level would bring CEA at least $700 million in start-up operating capital, according to the original statutory funding formula, which is still in law.[32]

2. The Internal Revenue Service would have to rule that the CEA was not required to pay federal income tax.[33]

3. To help achieve its initial, estimated insuring capacity, CEA was obligated to obtain committed reinsurance cover in an amount twice the (at least $700 million) initial (aggregate) insurer contributions. This $1.4 billion (or more) limit to be secured in initial reinsurance contracts would require a then-unprecedented reinsurance buy for a one entity writing a single catastrophe risk.

Note that because discussions with reinsurers were started long before the CEA was statutorily authorized to operate, long before CEA had acquired risks to insure, and long before CEA had employees or an office, the reinsurers had to be persuaded not only to consider the huge and unprecedented placement, but to reserve reinsurance capacity without payment—that is, they "warehoused" the cover, solely on an expectation that the CEA would meet the goals imposed as its operational pre-conditions. Without that cooperation, secured through efforts of reinsurance intermediaries and CDI staff, CEA would not have been able to commence

[32] See Insurance Code section 10089.15, subdivision (a): *Initial operating capital shall be contributed by insurance companies admitted to write residential property insurance in the state. Each insurer that elects to participate in the authority shall contribute as its share of operating capital an amount equal to one billion dollars ($1,000,000,000) multiplied by the percentage representing that insurer's residential earthquake insurance market share as of January 1, 1994, as determined by the board. A minimum of seven hundred million dollars ($700,000,000) in commitments shall be required before the authority may become operational*.

Note that the term "operating capital" does not mean or imply that contributing insurance companies acquired through their contributions any ownership interest in or control of the CEA or its funds, contributed or not—they did (and do) not, since the statute does not so provide. Anecdotally, the CEA has been told that at least one insurer attempting to use its CEA "initial operating capital" contribution as an offset or deduction from ordinary income was unsuccessful in that effort.

[33] This effort was successful, and both the process and the eventual ruling from the Service effectively operated to confirm the CEA as a hybrid, public-private "public instrumentality," effectively operating to do things its establishing government has declared important but in so doing, acting only for—and not as—the government. (Note that some of the original, short-lived thinking imagined CEA as a mostly "private" entity, operating wholly outside government. This separation from government—structurally, administratively, and financially—is key to the CEA's ability to operate in the fashion of a business in the markets in which it has a presence.

operations as and when it did: About 60 days after then-Governor Pete Wilson signed the final enabling legislation, the CEA opened its doors with a skeleton staff.[34]

When all three benchmarks were duly met, the insurance commissioner authorized CEA to commence operations as a provider of basic residential earthquake insurance, not as a licensed insurer but pursuant to an express statutory grant of authority.[35]

It is important to bear in mind that the State of California did not establish the CEA as an insurance company per se—an insurance company, absent special sanction in the Insurance Code, must be a corporation.[36] To the contrary, the CEA is by law termed a "public instrumentality of the State of California," and its business form is not additionally described in law.[37]

CEA accepted its first insurance risks as of December 1, 1996. From that day, the CEA has served a statewide, voluntary residential-earthquake-insurance market that most of the private insurance market had effectively abandoned, while making it possible for those same private insurers to operate in a manner they prefer—and to continue to insure the home/property risks they better understand and can profit from servicing.

## 6. The CEA Earthquake Insurance Policy

Operating now for nearly 20 years, the California Earthquake Authority provides, through its legal agents—its participating insurance companies, operating under a uniform contract with the CEA Governing Board and the California insurance commissioner[38]—a first-party, named-peril, catastrophe insurance policy of "basic residential earthquake insurance."[39]

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[34] The legislative effort to establish the CEA extended over both years of the 1995-96 California legislative session, and the last bills were signed into law in September 1996.

[35] Insurance Code section 10089.6, subdivision (a).

[36] Insurance Code section 699.

[37] Insurance Code section 10089.21.

[38] Insurance Code section 10089.9, subdivision (a).

[39] The law states that "…The authority shall be authorized to transact insurance in this state as necessary to sell policies of basic residential earthquake insurance…. The authority shall have no authority to transact any other type of insurance business." As noted elsewhere, the CEA is not a licensee of the California insurance commissioner and holds no certificate of authority.

CEA insurance contracts and insurance rates are developed by CEA itself and are subject to normal regulatory scrutiny by the office of the California Insurance Commissioner.

By law, CEA is the provider of the earthquake insurance that participating insurers offer by law to their home-insurance customers. There is a statutory proscription providing that CEA participating insurers are not permitted to compete with the CEA by selling any similar product.[40] Participating insurers are, on the other hand, authorized to "sell residential earthquake insurance products that supplement or augment the basic residential earthquake insurance provided by the authority."[41] These might be coverages or additional, higher limits that "wrap around" the CEA's basic policy. But in practice, only one CEA participating insurer has ever offered a wrap-around product, and that was short-lived.

This operational construct was reflected in the run-up to determining what insurance products CEA would sell, since legislators thought it important that California's residential earthquake insurance market, post-CEA-establishment, be similar to that market, pre-CEA. But participating insurers' home-insurance customers who wish to insure against earthquake loss must accept CEA earthquake products, which makes them subject both to the characteristics of those products as well as to CEA rating and pricing practices.

The result was that the California residential earthquake-insurance market did not look the same once CEA began operation. And between insurance agents' unfamiliarity with the new CEA and its untried product suite, and the CEA's new pricing, required by law to be actuarially sound and therefore considerably higher than what the private market had provided, CEA-earthquake-policy counts quickly began to drop statewide.

Because the wrap-around market from CEA's participating insurers had never developed, starting in 1998 the CEA began to offer additional limits in a so-called "supplemental" program, which was separately backed financially, per regulation—the CEA procured backing consisting of both reinsurance and a financial-guaranty cover. The decision to expand CEA coverage was by no means without controversy, as participating insurers strongly expressed concerns about over-extending the CEA just two years after its start, and—as important to them—the CEA's

40 Insurance Code section 10089.27, subdivision (b), paragraph 1. The effect of this provision, as well, is to assure that the CEA has less chance of adverse selection against it: Were participating insurers permitted to send some risks to the CEA and retain others, there could be said to be a moral hazard that they would choose to retain the risks less susceptible to loss.

41 Id.

accumulation of additional insured exposure. At least one participating insurer went so far as to publicly protest at a meeting of the CEA Governing Board, but the Board voted to move ahead with the supplemental program, which was quite modest what CEA offers today by way of much higher limits and new coverages. That early act of establishing a cumbersome supplemental product-set prepared the way for the CEA's modern earthquake products, and the old supplemental products were eventually folded into the CEA's portfolio without further concern or confrontation.

The California Insurance Commissioner has a non-regulatory role with CEA: he or she is a voting member of CEA's three-voting-member Governing Board. At the same time, CEA is regulated (following provisions of the CEA law) by the commissioner, although not precisely as a private insurer,[42] and CEA rates are regulated according to most provisions of California's rate-regulation laws and regulations. Since the commissioner has that dual role—board member and regulator—it is the habit of the commissioner to withhold a vote when the board takes up matters involving CEA rate approvals and requests regarding regulatory matters, such as insurance-contract measures. In practice, to date, the dual role hinders neither CEA operations nor regulatory efficacy.

The CEA's insurance-policy offerings are prescribed categorically by regulations of the California insurance commissioner, according to a statutory directive. The CEA itself has never issued regulations.[43,44]

## 7. Individual CEA Insurance-Policy Descriptions

CEA policies are available for renters or owners of any property type described in Insurance Code section 10087, subdivision (a) (a property covered by a "policy of residential property insurance"). CEA insurance comes in four basic forms, with homeowners coverages available in two alternative forms:

1. Homeowners[45,46]

[42] During the course of the legislative process in 1996, references in bill language to the CEA as an "insurer" were dropped. As a result, in present the CEA law there is no such reference.

[43] Although there is no express statutory authority for the CEA to issue regulations, such an issuance—conducted under the California Administrative Procedures Act through the California Office of Administrative Law—would be legally permissible under accepted principles of implied authority.

[44] See, e.g., California Government Code section 11340 et seq.

   a. Standard

   b. Homeowners Choice

2. Mobilehome/Manufactured Home[47]

3. Condominium Unit Owners (for any owner of a common-interest development unit)[48]

4. Renters (no property/structure coverage)[49]

The CEA homeowners forms are used to insure mobilehomes and manufactured homes. CEA sells no commercial coverages, whether for purely commercial/business risks or mixed residential-commercial. All current CEA policy forms are publicly available in their entirety as complete exemplars on the CEA website.

January 1, 2016, saw significant extensive additional limit and coverage options added, as well as new, higher premium discounts for earthquake-loss-mitigation steps completed (see Table 1).

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[45] CEA's newer homeowners product, Homeowners Choice, brings separation to the application of the policy deductible, as applicable to structure (Coverage A) and contents (Coverage C). In CEA's Standard homeowners policy, the Coverage A deductible must be met through structure damage before any contents loss (Coverage C) is payable—a policyholder with little structural damage but expensive contents damage would be disadvantaged. With Homeowners Choice, Coverage A and Coverage C have separate deductibles—in events that are severe enough to damage contents but not so severe as to damage the structure, a loss payment is thought to be more likely.

[46] Complete description of homeowners coverages here and here.

[47] Complete description of mobilehome coverages here and here.

[48] Complete description of condo coverages here and here.

[49] Complete description of renters coverages here and here.

**Table 1. CEA Dwelling-Policy Expansion, from Mini to Present Day**

| *Coverage* | *1995* | *1999* | *2012* | *2016* |
|---|---|---|---|---|
| | *Mini Policy* | *CEA First Expansion* | *CEA Choice* | *More Options, More Affordable* |
| Structure | Full | Full | Full | Full |
| Deductible | 15% | 10%, 15% | 10%, 15% | 5%, 10%, 15%, 20%, 25% |
| Personal property | $5,000 | Up to $100,000 | Up to $100,000 | Up to $200,000 |
| Loss of use | $1,500 | Up to $15,000 | Up to $25,000 | Up to $100,000 |
| Emergency repair | 5% of covered property, deductible applies | 5% of covered property, deducible applies | 5% of covered property, no deductible on first $1,500 | 5% of covered property, no deductible on first $1,500 |
| Mitigation discount | None | 5% | 5% | Up to 20% |

Although it does not directly sell its products to the public (all CEA products are sold by participating insurers), the CEA has a simple but robust estimated-premium calculator on its website, available to the public, and which is particularly popular with agents who are quoting price/coverage matters to clients.

## 8. Take-Up Rates for Residential Earthquake Insurance in California

The CEA does not independently calculate residential earthquake insurance take-up rates, relying instead on the California Department of Insurance and its official data calls. The Department's latest statistics were released on July 28, 2016, and describe residential property insurance and residential earthquake insurance policy information as of December 31, 2015[50] (see Figure 2 and 3).

[50] The full table of data-call results is available here.

**Figure 2. Drop-Off in Residential EQ Take-Up as CEA Began Operation**

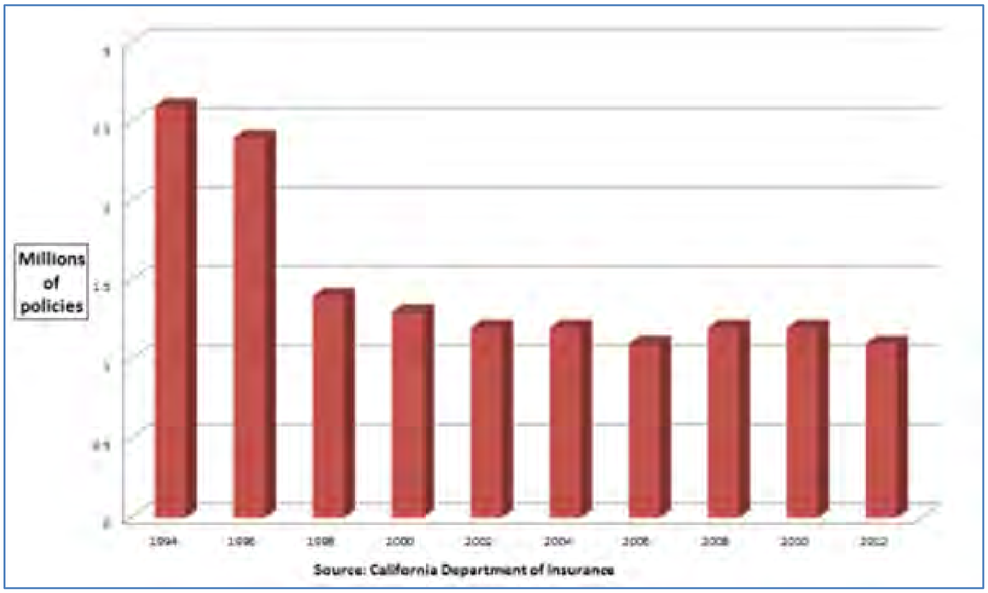
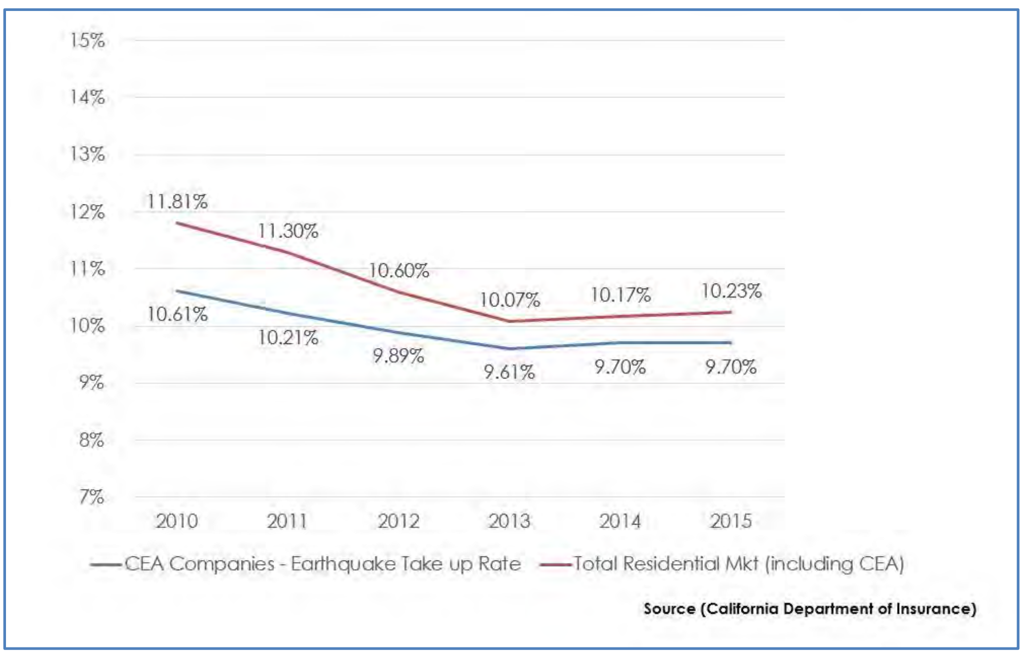



**Figure 3. California Earthquake Take-Up: CEA and Non-CEA**




Those latest statistics show the following. A total of 11,246,982 homeowners policies are written in California's residential market, covering $3,302,844,388,194 in aggregate insured exposure (ex-earthquake), and representing $8,103,293,197 in written premium. Dwellings, including dwelling fire and mobile homes, are 75 percent of total policies. Dwellings—not including dwelling fire and mobile homes—are 56 percent of total policies. Condos are just over 7.5 percent of total policies. Renters are just over 17 percent of total policies. CEA participating insurers represent 80.6 percent (by premium volume/policy count) of the residential property insurance market.

For the residential earthquake insurance market, CEA participating insurers wrote 879,537 CEA earthquake policies, covering $356,424,204,968 in aggregate insured exposure and representing $632,509,421 in written premium. Non-CEA insurance writers[51] wrote 271,431 policies, covering $166,791,565,784 in aggregate insured exposure and representing $351,962,095 in written premium. Further statistics on the earthquake insurance market:

- CEA writes just over 76 percent of California's residential earthquake policies but collects just 64 percent of written premium (all of this section's information applies solely to California).
- The average CEA premium is $719. The average non-CEA premium is $1,297.
- CEA rates, approved by the regulator and actuarially sound, are lower on average than non-CEA rates on average.
- Without CEA rate reductions, the average premium today on a CEA policy would be more than twice as high.
- Earthquake take-up for CEA participating insurers is 9.7 percent. Earthquake take-up for non-CEA home insurers is 12.45 percent.
- Earthquake take-up statistics are presented on a statewide basis—not on a regional or risk-area basis. For the earthquake insurance CEA writes, in certain local regions earthquake take-up is greater or lesser than the average. In general, take-up in Southern California (where rates are lower) is considerably higher than in Northern California (where rates are higher). It's likely, however, that factors

[51] Residential earthquake insurance is available from writers other than CEA, in two basic categories: (1) From residential property insurers that have elected not to participate in CEA (e.g., Firemen's Fund, Chubb, Travelers)—those companies may write their own quake cover or contract for it, pursuant to Insurance Code section 10084; and (2) from earthquake-only specialty insurers, which may be self-financed or financed by or with other entities (e.g., GeoVera Insurance, Arrowhead General Insurance Agency, Inc.) and which do not write homeowners insurance in California.
Residential property insurers that write homeowners insurance in California rarely, if ever, write standalone earthquake policies for California properties—a companion home insurance policy is required. GeoVera, Coastal Select (a subsidiary of GeoVera), Arrowhead (an agency representing insurers), and a few others offer standalone policies to owners but not to renters,

other than price influence take-up, belying the appearance of simplicity in the foregoing information.

The majority of CEA's insurance business is generated by Southern California risks. The take-up rate for residential earthquake insurance in 1993, before Northridge, was generally around 25 percent, on a statewide average basis.

## 9. California's Low Residential-Earthquake insurance Take-Up[52]

The question of why so many fewer households buy earthquake insurance today, 20+ years after Northridge, is frequently posed, and there are evidently several correct or partial answers. The precise interaction of the correct answers, and any one correct answer's preponderance, are unknown.

The basic reasons adduced through anecdotal information over years and backed by some of CEA's proprietary research are:

- Perceptions of price and value: "premiums too high," "deductibles too high," etc.
- A misconception that homeowners insurance covers earthquakes, even though the homeowners policies effectively,[53] expressly, and clearly exclude it.
- An insufficient appreciation of the risk of earthquakes to the home and family finances; an impression that earthquakes "never" happen, when in fact they happen rarely.
- Anticipated (but misplaced) dependence on post-event, government assistance (grants and loans made available by FEMA, SBA, etc.).

CEA earthquake insurance take-up is definitely on the rise, however. Table 2 shows an increase in the rate of take-up through August 31, 2016, and as of this writing (in November 2016), the more recent statistics show even higher numbers. CEA is presently making a concerted effort to understand, clearly and completely, why this felicitous effect is occurring.

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[52] According to the latest available Department of Insurance data, take-up rates for commercial earthquake insurance are somewhat lower (at 8.51 percent) than take-up rates for residential quake cover. It should be noted, however, that the average size of a commercial quake policy is much greater than the average size of a residential policy. There are 1.14 million residential quake policies representing $511.5 billion in insured exposure. On the commercial side, there just 83,717 policies (7 percent of the residential count) but representing some $168 billion in insured exposure (33 percent of residential exposure).

[53] See Insurance Code section 10088, making clear that an earthquake exclusion is effective.

**Table 2. CEA Growth, 2006-2016**

| | *CEA policy sales* |
|---|---|
| 2006 | 754,672 |
| 2007 | 775,464 |
| 2008 | 779,362 |
| 2009 | 800,930 |
| 2010 | 811,317 |
| 2011 | 820,932 |
| 2012 | 841,503 |
| 2013 | 841,836 |
| 2014 | 865,084 |
| 2015 | 879,540 |
| 2016* | 908,297 |

* As of August 31, 2016.

## 10. Respective Roles of the Public and Private Sectors in Providing and Promoting California Residential Earthquake Insurance

### *10.1. Providing*

CEA is the sole public (i.e., established by or operated in connection with a government) provider of residential earthquake insurance in California. In fact, it is the only public earthquake-insurance provider in the US.[54] There is no equivalent public provider of earthquake insurance in California for commercial risks.

By the same token, there are a number of private providers of earthquake insurance in California (writing earthquake, in the aggregate, for about 20% of the home-insurance market, by premium volume). But CEA is unaware of determined or general efforts by any of those

[54] The California FAIR Plan is an exception, subject to order of the California Insurance Commissioner.

providers—whether a provider of standalone earthquake products or an insurer writing earthquake insurance pursuant to its own legal requirement to make a mandatory offer—reaching out to consumers in order to promote or sell any of its earthquake products.

### *10.2. Promoting—A Bigger Picture*

As a creature of state statute, and an insurance provider that operates in a voluntary insurance market and insures risks using an insurance contract with its policyholders, CEA is regulated by California's insurance commissioner. The commissioner is a statewide elected official, overseeing a respected, professional department of over 1,300 persons. CEA rates are regulated in a transparent public process, in more or less the same manner as are rates of all similar personal-lines property insurance providers insuring California risks, but with additional transparency provided by both CEA's status as a public instrumentality and its information practices. CEA Governing Board and Advisory Panel meetings are conducted under the open-meeting laws of California, permitting most CEA decisions to be conducted and supported to the public in an open and transparent manner.

The California Legislature has, on several occasions in the past 20 years, acted to affect or assist the Authority's activities. Some examples are acting to (1) require the availability of installment payments for CEA policies, (2) authorize the CEA to hire a "chief mitigation officer" to oversee CEA loss-mitigation activities, and (3) change the mandatory offer of earthquake insurance to make its text more understandable and logical, and more relevant to CEA's practices and products, as well as requiring CEA participating insurers to provide CEA marketing materials on an annual basis to all their home-insurance customers across the state.[55]

[55] This is a complete list of legislative acts that have amended the CEA law or otherwise directly affected the CEA since its inception in 1996:

- AB 13 (1995): Established the CEA.
- AB 2086, AB 3232, SB 1993 (all 1996): Recognized that CEA, under the auspices of the California insurance commissioner, had met all the conditions to operation and, besides adding detail to the original establishment, authorized the CEA to commence operations.
- AB 331 (1997): Required availability of installment payments for CEA policies.
- SB 1716 (1998): Affecting a single insurer, revised certain capital requirements.
- AB 964 (1999): Instituted a retrofit-reporting requirement.
- AB 1048 (2003): Directed the CEA to create an unearned premium reserve and exempted those reserve funds from availability to pay CEA claims and other liabilities.
- SB 430 (2008): Confirmed the roll-off of the largest, most exposed insurer-assessment layer in the CEA finance tower and created a new 10–12 year layer far less exposed.
- AB 866 (2009): Revised an annual reporting requirement.

The finances of the California Earthquake Authority are wholly separate from the finances of the State of California or any subdivision of it. CEA receives no financial support through the California state budget—its sole capital comes from private sources (contributions from participating insurance companies, accumulations of surplus revenues, accumulated investment returns), and its sole revenue comes from premiums realized through sale (by participating insurers) of CEA insurance products and from investment returns. No governmental entity, state or federal, provides any funding, funding guarantee, or other financial backstop that would provide the CEA with claim-paying capacity.

The CEA operates by statute without benefit of sovereign immunity[56], and as an organization it has legal exposure—for its own market conduct and for other activities, both those that it conducts and those conducted by its agents, the CEA participating insurance companies—to the same kinds, and degree, of liabilities as would a private insurer.[57] By law, the State of California is not liable for CEA's insurance-related liabilities.[58] By law, the California Insurance Guarantee Fund (CIGA) provides no backstop for CEA's policy liabilities, regardless of the condition of CEA finances (insolvency, etc.).[59]

CEA funds are held solely by CEA, controlled solely by the CEA Governing Board, and available exclusively for the use of CEA. The CEA does not earn, control, disburse, or hold any state (public) money.[60] The California Department of Finance (the governor's budget agency,

- AB 2746 (2010): Authorized a chief mitigation officer position and expressly authorized CEA to receive grants and gifts of property for mitigation activities.
- SB 71 (2013): Removed the 25-employee civil service employee limit.
- AB 2064 (2014): Updated mandatory offer wording, clarified CEA's spending cap, and required participating insurers annually to provide each of its residential-property insureds with CEA-related marketing documents at the authority's expense.
- SB 84 (2015): Provided funds, indirectly, to CEA for use in California Residential Mitigation Program (joint powers authority) retrofit-grant program (actual mechanism was one-time appropriation to CDI, grant from CDI to CEA, contribution by CEA to CRMP).
  Also laid statutory groundwork for retrofit programs for residential structures with one to four dwelling units and residential structures with two to 10 dwelling units. Importantly, exempted direct or indirect CEA retrofit grants from California state income tax.

[56] See Insurance Code section 10089.21.

[57] See Insurance Code section 10089.7, subdivision (e).

[58] See Insurance Code section 10089.35, subdivision (d).

[59] See Insurance Code section 10089.16, subdivision (m).

[60] See Insurance Code section 10089.22, subdivision (b).

which deals with state agencies and departments on state-budget matters) does not supervise or serve as intermediary for the CEA's budget, and CEA's contracting and procurement programs are handled by the CEA itself under Governing Board authority, not within the umbrella agency that handles such undertakings conducted by or for the State of California.

CEA participating insurers, operating in various legal forms but always as private companies (with the exception of the California FAIR Plan--as elsewhere, an association of insurers), do not insure residential earthquake risks in California as obligors under their own insurance contracts, under which a participating insurer would directly assume insured quake risk. Participating insurers, however, have had and still have today—after over 20 years of CEA operations—a statutorily defined, residual share of CEA's earthquake-insurance liabilities, a cover provided to CEA without charge as a sort of "free reinsurance" under strictly controlled and transparent rules and notifications. Through the (so-called) "insurer-assessment layers" in CEA's financial structure, CEA participants are shown as having a contingent liability, collectively, which annually is apportioned by CEA among all the participants according to their respective CEA-market shares.[61]

CEA's participating-insurer assessment layers have changed, however, during the CEA's 20 years: Originally, by law, there were two layers—one lower in the financial tower and therefore more exposed to CEA earthquake losses, and one higher and, so, less exposed. After 12 years, the largest and most loss-exposed layer expired, according to the original CEA law; the second layer remained. At the time of first-layer expiration, a new layer was introduced, higher in the tower than the remaining second one.

Today (, the original second layer remains in place, its amount varying only by the level of insurer participation in CEA (i.e., it has increased). And the new layer—after close to 10 years of attrition dictated by its statutory construct—is fast disappearing. The new layer will likely reduce to zero in 2017, leaving only the original second layer, which itself will begin to reduce, by law, once CEA's available capital reaches and remains at $6 billion.

[61] See Insurance Code section 10089.23, subdivision (a), paragraph (2). The CEA generally depicts its claim-paying capacity in a graphic tower illustration, with differently colored layers indicating different financing sources—CEA calls this its financial tower.

Possibly heeding the lessons of the then-recently repealed CRER Fund (see footnote 31), the California Legislature took clear steps to invest the CEA with various layers of financial security and claim-paying capacity: authorizing mandatory participating-insurer contributions; a state-premium-tax exemption for CEA premiums; authority to purchase reinsurance and other risk-transfer in their respective private markets and based on reasonable, business-oriented criteria; the clear legal authority to enter into debt transactions based on its own surplus-accumulation and claim-paying needs; the clear legal authority to borrow and repay using policyholder assessments (and the ability *not* to do that); and the legal ability and clear statutory backing to accumulate capital under helpful, capital-preserving definitions of capital availability.

In addition, the Legislature authorized and permitted CEA to accumulate, invest, and spend its resources in a way that is wholly independent of usual California-state-government processes, in conjunction, however, with spending limitations and other limitations on organizational size. CEA management, operating under authority from CEA's Governing Board, has taken on the capital-preservation charge, working with stakeholders to assure CEA's obligations and financial strength are preserved, publicly known and understood, and transparently presented.[62]

So from a present-day standpoint, it's fair to observe that all of the foregoing establishing principles of the CEA law have borne the fruit that those planning the CEA might not have fully contemplated (but would have wished for): CEA's capital accumulation over 20 years, coupled with a lack of large, damaging earthquakes in the same period, has permitted CEA to weather the loss of substantial participating-insurer assessment layers by deploying but conserving capital, purchasing risk-transfer products using an ever-expanding portfolio of methods and sources, and incurring pre-event debt as a capital-preserving, capacity-enhancing tactic. Without CEA's statutorily supported and broadly respected ability to preserve its revenue stream and grow and conserve its capital, honored even in the face of years of California's well publicized state-budget woes, CEA could be in a lesser position today.

It is common in the universe of public catastrophe-risk organizations around the globe that the organizations, single- or multi-peril, that provide insurance or the practical equivalent to its residents, citizens, businesses, and institutions have the benefit of some level of government

[62] CEA's financial strength is rated by the A.M. Best Co. as "A-minus 'Excellent,'" and CEA's debt issuances are awarded native (i.e., a rating awarded without the rated entity's use of credit-enhancing products) investment-grade ratings by both Fitch Ratings and Moody's Investors Service.

financial involvement, almost invariably from their federal government. That involvement can take various forms, qualitatively and quantitatively, but whether the involvement is formulated primarily to relieve the private insurance industry of excess exposure, establish and support staffing requirements, or establish a conduit through which to distribute government-aid funds in an orderly, predictable fashion, the support effort is structural and often significant.

In the case of CEA, however, there is no direct government support. Because of the CEA's structure, legal status, public purpose, and public-facing activities, the CEA is not a federal taxpayer. That tax status allows CEA to retain and use for the benefit of the public and all its appropriate stakeholders a significant sums, which otherwise would be remitted as federal income tax. The CEA law provides expressly that the CEA is exempt from California's premium tax, the in-lieu tax to which insurance companies in California are subject and which replaces, for insurers, most state-levied taxes (except property tax and sales tax). Under California's state constitution, it is possible the CEA would be exempt from the premium tax even without this statutory pass, but the statute makes clear that in enacting the CEA law, California considered the exemption's character to be a "contribution by the state and its citizens to the capital and operating revenues" of the CEA[63]—a status taken into account by the Internal Revenue Service.

After 20 years in business, CEA alone occupies the public stage in California for providing insurance for residential earthquake risks. And the ways in which CEA and its stakeholders, as described, accomplish that role, both directly and indirectly, also tend to promote earthquake insurance as a sensible means of planning for protecting a family's finances.

## 11. Incentives for Risk Reduction

The simplest mode existing within what is now a broad scope of CEA programming for recognizing and providing visible, tangible incentives for actions constituting direct earthquake-risk reduction is the earthquake-retrofit premium discount that is statutorily established[64] at no less than five percent of a policyholder's annual CEA premium.[65] The CEA law as originally conceived expressly contemplated a larger-than-five-percent discount, but any richer discount

[63] See Insurance Code section 10089.44.

[64] See Insurance Code section 10089.40, subdivision (d).

[65] See Insurance Code section 10089.37.

required the occurrence of two conditions: the discount rate could be raised only upon Governing Board approval, which in turn must be based on formal actuarial opinion.

CEA accomplished a valuable and crucial step when, commencing in 2016 and with both Governing Board and actuarial support, it began to offer dramatically higher retrofit discounts—now ranging up to a 20-percent reduction in a policyholder's annual CEA premium, depending on the age of the insured structure: Pre-1940 CEA-insured houses receive the maximum 20-percent discount, while newer houses (to 1979) receive lower discounts, down to the basic five percent noted above.

The basis of the new, substantially more generous discount schedule is the actuarial determination that an older dwelling, depending on its year of construction and the building codes existing in California in that year, are typically more susceptible to damage from earthquake shaking, including in extreme cases an earthquake's causing the house to slide off its foundation (with exceptions, that sort of damage is often adjudged a total loss for insurance purposes).

The California building codes existing today that pertain to new, single-family residential construction were adopted in 1979. CEA considers those codes to be a sufficiently modern expression of basic earthquake-resistant building techniques that CEA classifies dwellings built after 1979 to be already "retrofitted": that is, those structures were erected under California's most modern residential building code, and the rates those structures enjoy are, effectively, already adjusted to reflect their greater resistance to earthquake-induced damage. So even though no discount appears on an insurance bill for the CEA policy covering this newer construction, the rate is already adjusted to reflect the improved risk.

## 12. Mobilehome Retrofits

CEA also offers retrofit-based premium discounts to CEA policyholders who are mobile home owners. According to the Association of Bay Area Governments, mobilehomes are two to five times more vulnerable to earthquake shake-damage than woodframe houses. That means that when subjected to strong shaking, unbraced mobilehomes can fall off their foundations, as widely occurred in the 1994 Northridge earthquake. Mobile homes require a very different retrofit from a constructed single-family dwelling such as a house—they have need of an Earthquake Resistant Bracing System certified by the California Department of Housing and

Community Development ("HCD") under the California Administrative Code[66]—the cost of which is often less expensive, and always less structurally extensive, than a retrofit of a typical California woodframe house whose retrofit is covered by the applicable existing-building code in California. The mobilehome-retrofit technique is well understood, and certification requirements and standards are embodied in California state law. Mobile homes receive an average 23 percent premium discount in CEA premium if reinforced by an earthquake-resistant bracing system that is HCD-certified.

## 13. Acceptance by Policymakers and the Public of CEA Mitigation Programming

In the past four years, an ever-increasing part of the CEA's operations are focused on, or take direct account of, loss-mitigation through retrofitting. Generally authorized in law since CEA inception but fully operational in present form only in recent years, retrofitting projects and action steps—grant programs, education through new website development, spreading the mitigation message through traditional CEA channels as well as special opportunities, meetings and community engagement, massive financial and policy support of a joint powers authority whose mission is retrofitting, lobbying for mitigation-forward legislation (including legislation at both state and federal levels to make mitigation grants income-tax free—are devoted to mitigating the effects of earthquakes on CEA-insurable residential structures.

The CEA's latest Strategic Plan recognizes that dedication explicitly, expressing the CEA's primary goals as Educate, Mitigate, and Insure—a significant expansion from its earlier plan, which focused on insuring only.

CEA is finding that broad support of mitigation is relatively easy to advance, build, and attain among diverse stakeholders, other interested parties, and the media, since it seems that most people understand that it is generally cheaper to prevent a problem than it is to repair the damage suffered when the problem occurs—in other words, an ounce of prevention is widely seen to be worth a pound of cure.[67]

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[66] See Article 7.5 of Chapter 2 of Division 1 of Title 25, California Administrative Code.

[67] Presciently, Benjamin Franklin fashioned a philosophical underpinning of a modern seismic retrofit, since he was manifestly insurance-savvy:

## 14. Rate-Setting and Distribution of the Costs of Earthquakes

### *14.1. How the CEA Policy Distributes the Costs of an Earthquake*

All types of CEA residential earthquake insurance products are fully rated insurance products. Rates are differentiated across 19 contiguously constructed rating territories, assigned so as to take into account geographical risk. CEA rating territories, however, have not changed much over the years, where changes (if implemented) could take into account changing exposure or loss experience. It appears there has been limited need to do so, and each of the 19 contiguous territories is still considered by the CEA (and, evidently, by the regulator) to be sufficiently homogeneous.

CEA policies' deductible structure, policy sublimits, coverage exclusions, policy-language definitions, and insuring agreement itself serve as tools to distribute the cost of earthquakes between CEA and its policyholders, regardless of CEA-policy type.

- Deductibles. The deductibles CEA imposes in structure and contents coverages range from 25 percent down to just five percent, which CEA believes equals the lowest available deductible in the market. The size of the deductible is inversely related to the required premium: the highest deductibles are priced lower, while the lower deductibles are priced higher. The customer chooses the deductible level. The 5 percent, 20 percent, and 25 percent deductibles are new for 2016: CEA is seeing evidence of consumers having made considered decisions about deductible size within the new range of options, which presumably is also evidence of a customer having made a financial/earthquake risk analysis, with opportunity to employ that analysis through the policy purchase. The deductible mechanism is applied in different ways in the various CEA policy forms.
- Policy sublimits. Like most property-insurance products, CEA policies apply sublimits to loss categories and to certain specific losses that are either difficult to adjust or prone, in

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*Fires were very dangerous threat to Philadelphians, so Franklin set about trying to remedy the situation. In 1736, he organized Philadelphia's Union Fire Company, the first in the city. His famous saying, "An ounce of prevention is worth a pound of cure," was actually fire-fighting advice. Those who suffered fire damage to their homes often suffered irreversible economic loss. So, in 1752, Franklin helped to found the Philadelphia Contribution for Insurance Against Loss by Fire. Those with insurance policies were not wiped out financially. The Contributionship is still in business today.*

common insurance experience, to fraud. CEA believes its sublimits are within industry practices, and to date, none has been disputed.

- Coverage exclusions. The CEA policy, despite far-reaching improvements and expansions since the earliest days of CEA, when the statutory mini-policy with very low limits and restricted coverages was the sole product on offer, still does not cover large things commonly covered in home policies. For that reason, direct and indirect coverage exclusions still represent a strong loss-distribution tool for CEA. For example, if a garage is detached from the house, it is not covered, no matter how large or architectural it might be. Similarly, a pool, pool house, and gazebo and garden structures are not covered.
- Policy-language—basic definitions. The CEA policy uses definitions of "earthquake" and "seismic event" developed originally with the assistance of the California government's head geologist.
    - A part of the CEA policy's definition of earthquake is that ground-shaking caused by human activity (e.g., blasting, energy-producing geothermal activities, hydraulic fracturing (which is commonly called "fracking")) is not considered an earthquake—the language is intended to provide that CEA insures against natural-catastrophe events, not human-induced ones.
    - In a similar vein, the CEA-policy definition of seismic event places a 15-day temporal frame around the main shock; scientific sources are used to establish this parameter. With a new policy taken out during a seismic event, there is no coverage until the seismic event is over; and if there was covered damage, and if there are shocks continuing after the 15 days, the CEA could seek to impose a second deductible and require a second claim, all on the basis of the occurrence of a new seismic event.
- Insuring agreement. The CEA policy's insuring agreement provides, "This policy insures for accidental, direct physical loss from an earthquake that commences during the policy period as part of a seismic event that commences during the policy period to property described," etc. Note that in using this language, CEA intends that both earthquake and seismic event are understood as defined terms, above, and the language as a whole is carefully drawn. The insuring agreement, therefore, simply underscores that CEA issues a single-peril policy whose insurance benefits are restricted. Put another way, the CEA policy still has some attributes of a statutory mini-policy in certain basic coverage respects, even though CEA has added new coverages (extra building-code upgrade,

breakables, emergency repairs, etc.), and available limits for contents and loss of use (additional living expense) are today much higher than at CEA's inception and much more in keeping, therefore, with what people would find useful and therefore wish to buy.

### *14.2. There Are No Observable Implicit or Explicit Cross-Subsidies among CEA Policyholders*

The CEA operates in a regulated environment to assure that there are no unpermitted or unintentional cross-subsidies among groups of CEA insureds (the mild levelling effect of using contiguous rating territories, however, is noted above). That effect, to the extent it exists, is likely moderated by the CEA's use of 19 distinct, albeit contiguous, rating territories.[68]

In addition and important to the cross-subsidy question, CEA rates are required by law to be actuarially sound and based on the best available science.[69] A typical attribute of actuarially sound rates, of course, and a bedrock principle of insurance is that the future expected cost of insuring a risk must be recovered through application of an appropriate rate. This, CEA rates accomplish under California's transparent rate-regulation laws.

Still, there can be variation about what "actuarial soundness" is in the context of property-insurance principles. In a 2012 study and report, the Actuarial Soundness Task Force of the American Academy of Actuaries (the "Task Force") stated, "[u]nlike the Health actuarial practice example, the Actuarial Standards of Practice applicable to property/casualty practice do not directly define the term actuarially sound or actuarial soundness."[70]

In reference to the National Flood Insurance Program (NFIP), the Task Force observed that the Government Accountability Office in 2001 concluded that the NFIP "…is not actuarially sound. Because the program does not collect sufficient premium income to build reserves to meet the long-term future expected flood losses, including catastrophe losses, it is inevitable that

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[68] As noted above, in the earliest year of CEA operations, CEA adjusted territories and rates.

[69] See Insurance Code section 10089.40, subdivision (a).

[70] *Actuarial Soundness* (American Academy of Actuaries–Actuarial Soundness Task Force)–May 2012: at page 17. [NOTE: The Task Force was chaired by Shawna Ackerman, formerly the CEA's principal consulting actuary and now the CEA's Chief Actuary.]

losses from claims and the program's expenses will exceed the funds available to the program in some years and, cumulatively, over time."[71]

The Task Force noted two factors that the GAO had cited in its 2001 report:

1. Congressional authorization of subsidized insurance rates, which alone caused (by 2000) a $500 million shortfall.
2. Use of unrealistic average annual loss numbers, selected in such a way as to eliminate the potential of catastrophic average losses.

Neither of these observed, problematic approaches characterizes CEA rate-setting, or for that matter, the philosophy of the CEA Governing Board or the approach of the California insurance commissioner, especially after the advent of Proposition 103 rate-regulation. And in addition, although they generally do this subtly and professionally, CEA's participating insurers are closely interested watchers of CEA rate (and capital-preservation practices) practices, since an inadequate or unsound rate would—to some non-trivial extent—increase their likelihood of being exposed to (or reduce the greater amount of protection that greater CEA retained capital would provide against) CEA earthquake-insurance losses, a predefined portion of which can be passed on to participating insurers through the CEA law's statutory assessment mechanisms.[72]

The result of the lack of objectionable subsidy in the CEA rate structure might not be altogether felicitous for all who may be interested in or desirous of CEA earthquake insurance. For example, the CEA-insurance premium for a sample house in San Francisco (CEA's highest-rated territory) is four times higher than the "same" house in Sacramento (CEA's lowest-rated territory). Who could blame a San Franciscan for wishing for some subsidy when they are quoted CEA earthquake-insurance pricing set using actuarially sound rates?

Of course setting up a price comparison using exactly the same coverages and limits as between San Francisco and Sacramento arguably does not really replicate what risk-informed San Franciscans—using a canny insurance agent, and looking to maximize coverage for the

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[71] Id. at page 21, citing *Flood Insurance, Information on the Financial Condition of the National Flood Insurance Program*, US General Accounting Office, July 19, 2001, At page 3. Available at http://www.gao.gov/new.items/d01992t.pdf; last visited on November 2, 2016.

[72] The assessment mechanisms are laid out in detail in Insurance Code sections 10089.30 and 10089.31, with the latter being a total 10–12-year exposure for participating insurers and subject to mandatory reduction under the terms of section 10089.33, subdivision (b), and the former being subject to conditional attrition, only after the CEA attains $6 billion in available capital, according to section 10089.33, subdivision (a).

important things they own, choose deductibles strategically, and not insure the things unimportant to their life—would do. Being strategic about earthquake risk and an earthquake-insurance purchase could narrow that pricing gap, if the buyer can take advantage of CEA products' flexibility and coverage/pricing options.

But that will not eliminate the gap—actuarially sound rates and a solid, regulatorily acceptable rating plan will invariably make insuring a home in a seismically active place considerably more expensive than insuring the "same" home, in the same way and to the same extent, where the earth does not shake or the soil liquefy—this can be said to be the state of things the CEA law was enacted to provide.

### *14.3. Is There Some Level of Premium Beyond Which Consumers Resist Paying?*

Consumers often cite "price" as influencing their decisions not to buy residential earthquake insurance. But it's not clear to CEA that the pricing signal is being fully analyzed by prospective insurance buyers, who after all can see the policy *price* upfront and clearly, but are less able to see or imagine the eventual *cost* of going without earthquake insurance.

CDI statistics plainly show[73] that in California, earthquake insurance is—on average—more expensive than homeowners insurance, although the difference between premium levels for CEA companies and CEA insurance is considerably less than the same differences in the non-CEA market. This means that, while it might not be a matter of sheer unaffordability that leads people to complain of high prices, the cost of owning CEA earthquake insurance is by no means trivial.

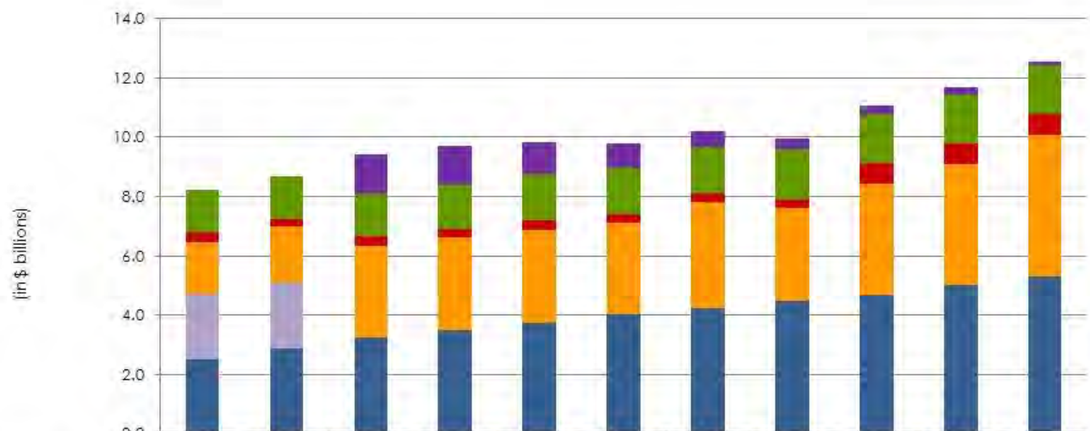
Although it is difficult or impossible to measure "resistance" to paying a high premium, it is safer to conclude that a structure of overall "high" premiums ("high" meaning significant, impactful, not trivial), coupled with other factors (no requirement to buy, deductible levels, nature of the insurance and coverage limitations, expectations of government bailouts), tends to keep people from buying the product.

[73] In its year-end 2015 study, released in July 2016, CDI's data-call derived information shows that for CEA companies, home insurance has an average premium of $677 while the CEA earthquake insurance average premium is $719. For non-CEA companies, the average home insurance premium is $902 while the average non-CEA earthquake insurance premium is $1,297.

### *14.4. How Are the Most Extreme Events Financed?*

CEA modeling shows that the CEA could pay all claims arising out of approximately two and one half Northridge earthquake "reoccurrences," and similarly could withstand a San Francisco 1906 "reoccurrence" with considerable capital and capital-equivalents, in excess of $2 billion, remaining. This is shown in Figure 4.

**Figure 4. Composition of CEA Claim-Paying Capacity for Past 10 Years**




| | 2006 | 2007* | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total CPC | $8.244 | $8.695 | $9.411 | $9.685 | $9.840 | $9.777 | $10.179 | $9.949 | $11.081 | $11.667 | $12.544 |
| New Industry Assessment | $- | $- | $1.304 | $1.304 | $1.095 | $0.804 | $0.500 | $0.385 | $0.312 | $0.238 | $0.128 |
| 2nd Industry Assessment | $1.465 | $1.465 | $1.465 | $1.465 | $1.558 | $1.558 | $1.558 | $1.656 | $1.656 | $1.656 | $1.656 |
| Revenue Bonds | $0.311 | $0.254 | $0.311 | $0.311 | $0.311 | $0.317 | $0.314 | $0.314 | $0.664 | $0.668 | $0.680 |
| Risk Transfer, 1st Layer | $1.756 | $1.885 | $3.100 | $3.100 | $3.123 | $3.050 | $3.557 | $3.115 | $3.759 | $4.091 | $4.783 |
| 1st Industry Assessment | $2.197 | $2.197 | $- | $- | $- | $- | $- | $- | $- | $- | $- |
| CEA Available Capital | $2.515 | $2.894 | $3.231 | $3.505 | $3.753 | $4.048 | $4.250 | $4.478 | $4.689 | $5.014 | $5.297 |

*In 2007 Revenue Bond proceeds were split between the Base and supplemental programs.

**as of August 31, 2016

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A feature of the CEA law is that federal bankruptcy and state-law assignments for the benefit of creditors are prohibited.[74] Also prohibited is the customary authority of the insurance commissioner to conserve or liquidate (or both) CEA.[75] Those features of the CEA law heed two basic CEA tenets, which also operate to redistribute theoretical risks arising from non-payment of claims. First, the CEA is authorized (without a regulatory or other court proceeding) to prorate its claim payments, or to make installment payments to claimants, if CEA determines its funds are insufficient to pay claims at 100 cents on the dollar.[76] Although this sort of occurrence

[74] See Insurance Code section 10089.21.

[75] Id.

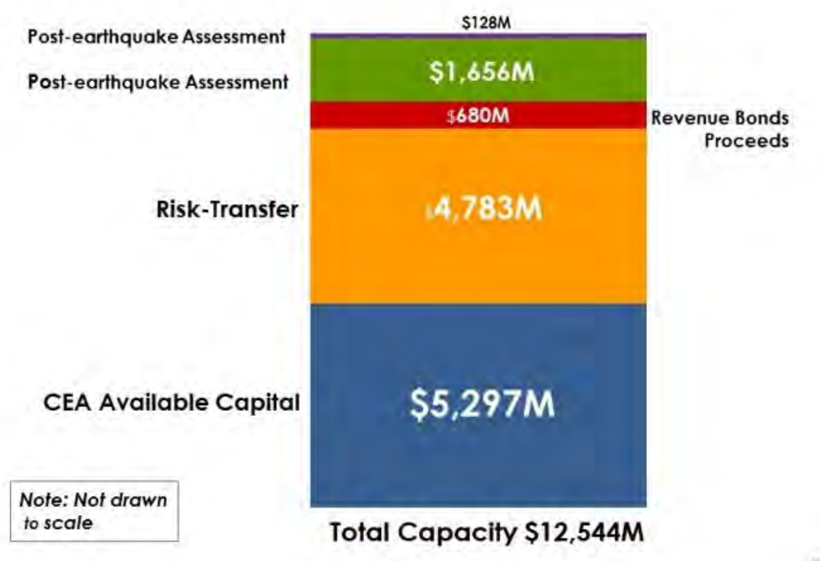
[76] See Insurance Code section 10089.35.

would be exceedingly rare, given the CEA's financial capacity, its occurrence is not impossible. Second, the CEA is authorized to surcharge all its policyholders (under strict conditions and limitations) in the event certain authorized capacity-providing features are exhausted.[77] This paper won't discuss this topic in any depth, since the CEA Governing Board has not implemented or relied on this potential authority for well over 10 years. By law, CEA customers receive notice of this possibility when they buy a CEA policy.[78]

### *14.5. What is the Division Between Pre-Event and Post-Event Financing?*

The CEA is authorized to fund its claim-paying capacity through both pre-event and post-event financing techniques (see Figure 5). Pre-event, the CEA can make use of bonds, reinsurance, and other forms of risk transfer. Post-event, the CEA can issue bonds, borrow from pre-arranged lending syndicates, use risk transfer, or make use of any other sort of facility available on the open market or by contract.

**Figure 5. CEA Claim-Paying Capacity Snapshot: August 31, 2016**




[77] See Insurance Code section 10089.29.

[78] See Insurance Code section 10089.28, subdivision(b).

As a general proposition, the CEA was established as, and has always remained, an insuring entity that secures, accumulates, and pays for most of its claim-paying capacity in advance of occurrence of the insured peril. Reinsurance and other risk-transfer mechanisms are based on then-current pricing: a one-year contract is completely paid for within that year, a short multi-year contract has uniform pricing, a longer multi-year contract may have price (and other) adjustments, and so on.

### *14.6. Premium Assistance for Lower- or Middle-Income Households or Small Businesses*

The CEA does not offer direct assistance or other subsidy for CEA premium payment by lower- or middle-income households. CEA does not sell any policy that covers property losses by any commercial business entity. By the same token, the CEA's mitigation program (and the CRMP program operated jointly with the state agency, California Governor's Office of Emergency Services) does not offer special grant assistance or terms to lower or middle income households. No mitigation grants are available for business properties.

The CEA staff and mitigation program staff (the latter working both with CEA mitigation programs and joint mitigation programs), armed with the knowledge that statutory language expressly permits unrestricted outside contributions from various sources to fund CEA-related mitigation efforts,[79] have discussed publicly the possibility that certain outside contributions might be made subject to conditions—conditions such as individual or community resources and wealth.

For example, the US Department of Housing and Urban Development's ("HUD") Community Development Block Grant ("CDBG") Program establishes so-called "entitlement" and "non-entitlement" grants. HUD handles each type differently, and grant amounts are set according to HUD procedures that "[determine] the amount of each grant by using a formula comprised of [sic] several measures of community need, including the extent of poverty, population, housing overcrowding, age of housing, and population growth lag in relationship to other metropolitan areas." Thus far, the CEA—although expressly authorized by its law to receive directly, inter alia, federal funds[80]—has neither sought nor received HUD funding, and

[79] See Insurance Code section 10089.7, subdivision (k).

[80] Id.

so the issue has not been squarely presented of the effects on CEA programming of accepting resource/income-restricted funds.

### *14.7. How Are Technical Risk Costs Modeled and Calculated?*

CEA uses a catastrophe loss model (CoreLogic RQE) to estimate average annual losses—the technical risk cost—having both technically evaluated that model in depth and worked with CoreLogic (and its direct-predecessor companies) for 20 years. Insured risks are modeled based on their characteristics: type of construction, age of construction, location, number of stories, foundation-type, presence of retrofit measures, and insurance coverage selections, coverage amounts, and deductible. Modeled results of CEA risk costs are validated, for various purposes, in a process using models supplied or operated by two additional commercial modeling firms, RMS and AIR Worldwide. Other modeling results are made available to CEA during the course of instituting and completing risk-transfer arrangements and purchases.

The process begins with collaboration between the leaders and staff of CEA's Finance and Operations Departments, working with the CEA's Chief Actuary. Policy forms, which in important ways form the basis of the risks the CEA (or any insurer) takes on by contract, are drafted primarily in-house by CEA Operations and CEA Legal/Compliance staff, with assistance from outside legal counsel who are expert in the laws that shape insurance-policy drafting and insurance-coverage interpretation.

Complete rate-related materials are presented publicly to the CEA Governing Board, which then considers its approval. Upon Board approval, the materials are filed in a public filing with the California Department of Insurance ("CDI"), which under direction of the insurance commissioner administers California's insurance-rate law.

The process with the Department consists generally of several months of communication and working out of details. CEA's participating insurers are given ample notice of rate-related matters, and although it's not necessarily straightforward for CEA or insurers to coordinate in the close manner required, the process does resolve and rates are implemented.

### *14.8. To What Extent is the "True" Cost of the Risk Visible?*

The "risk-only" portion is not directly visible, but because CEA expense loads are filed by CEA as part of California's public rate-regulation process, the risk portion for each risk class could be ascertained. On the other hand, and as a general matter, the "true" cost of the insured risk is fairly evident in prices derived through use and application of the CEA's rating plan. Risk signals inherent in rates in CEA's highest-rated territories may be somewhat muted due to CEA's use of contiguous rating territories—depending on implementation and speaking theoretically, "banded" rates[81] could signal the risk more clearly to the policyholder. Although there is no location in California that would *never* experience an earthquake, rates in the lowest-rated territories may over-estimate the actual risk of a damaging earthquake, assuming policyholders don't know they are being charged the lowest possible CEA rate (because CEA imposes a minimum premium).[82]

### *14.9. Is Risk Communicated Effectively?*

Communication of risk is a distinct challenge to any risk-specific organization—like CEA—whose declared public and business mission is helping individuals and families learn of, understand, and address their risks arising from earthquakes. CEA offers high-quality information (largely curated from indisputably reliable sources), education, public outreach, risk-mitigation programs, and insurance products.

The CEA is currently spending more than $10 million annually, and uncounted person-hours each year, to communicate risk information through marketing and advertising, public outreach, cooperative ventures, and collaborations with interested individuals and organizations.

Risk information, as described immediately above, is communicated to some degree through CEA rates, as applied by CEA's approved rating plan. But it is safe to say, the CEA believes it is actively and continuously searching for effective ways to communicate risk, believing that when individuals personalize and internalize the earthquake risks they face, they are more likely to take effective action to address and mitigate those risks.

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[81] A rate-band plan does not use contiguous territories, which deal (somewhat imperfectly) with geographic risk. Instead, properties representing the same risk level—regardless of geographic location—are placed in the same rate band. Rating bands provide for great homogeneity of risk: low-risk prices could be very low (subject to an insurer's minimum-premium rules) and high-risk prices could be very high indeed, absent capping. The CEA considered moving to banded rates in the early 2000s but rejected the idea on account of the difficulty, time, and dislocation anticipated in changing from contiguous territories.

[82] CEA is finding that its new 5 percent deductible—a potentially valuable (but pricey) option in a high-rated territory—is seeing its main popularity with CEA policyholders in the lowest-rated territories. Clearly, those customers—who already pay less for their policy, dollars to doughnuts—are shopping for value, and a 5 percent deductible is both relatively inexpensive and most effective at keeping the cost of earthquake risk within the CEA rather than being retained, as with a high-deductible policy.

### *14.10. To What Degree is Risk-Based Rating and Insurance Pricing Occurring?*

CEA rates are required by law to be actuarially sound for the risk classifications, as designed. Rating and pricing are risk-based and transparent, as more fully described above.

### *14.11. Are Risk Costs Incorporated into Property Design, Prices, or Development Decisions?*

Although these matters are for the most part outside CEA's direct charge, there is no evidence on which CEA is aware that California real estate prices signal or reveal the earthquake risks to which the properties offered for sale or lease are susceptible. CEA is working, however, with California's Applied Technology Council on projects (including a phone/tablet app) which will serve to enhance and make more clearly available to property owners, and to property buyers and sellers, information about the susceptibility of a given property to earthquake damage, providing a grade or score as a result that is based on public, reviewable criteria.

Essentially, California changes its building codes to respond to new information and understandings that invariably follow each major earthquake event. This means that newer construction is thereafter designed to withstand earthquakes better than older construction.

There are land-use planning statutes (for example, the Alquist-Priolo Earthquake Fault Zoning Act) that provide some limits on where in California property can be developed for housing.[83]

## 15. Conclusion

Replicating CEA—or specifically applying its management and insuring techniques and its California-earthquake-oriented experiences and goals—at a micro level might not be practicable in the setting of other risks, other locations, or other public imperatives. But basic CEA theses should be transferable and practicable, not precisely as within CEA but according to the results they are expected to achieve as they run through the target structure.

For example, California's personal-lines-insurance rate law and regulations have detailed provisions and paths, designed to constrain (through applied regulatory authority and without

[83] Alquist-Priolo became law after the 1971 M6.6 San Fernando earthquake. It is intended to reduce losses from surface fault ruptures. The core of Alquist-Priolo is human safety, by prohibiting siting most structures for human occupancy across traces of active faults.

creating government failure or government-induced market failure) rating and market practices not conducted in the public interest. CEA's rates—which are built on cross-validated modeling of California's housing stock, soil conditions and topography, and great and widely distributed earthquake hazard—are required to be actuarially sound and based on the best available science. Legally and scientifically, CEA rates are born and live in California.

But as California-specific as those enumerated factors are, the transparent application of responsible and sound insurance principles, coupled with rates based on valid and responsibly analyzed modeling, are not California-only. With purpose, they can be applied anywhere, to any catastrophe-insurance goal.

That much is obvious. What might be less obvious—and this is borne out by the author's observations of CEA and of catastrophe-insurance organizations around the globe—is that a public organization that is allowed to operate with suitable and transparent independence under an arrangement of trust, and that is unambiguously directed to operate in the public interest under recognized financial, management, and scientific principles, can act responsibly and insure effectively, and ultimately be helpful. In that manner, public goals are met and the existence and worth of private homes are safeguarded.