HAWAII CAPTIVE INSURANCE COUNCIL

CAPTIVE INNOVATIONS

Thinking Differently

2023

The Rise of Parametric Solutions

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The Rise of Parametric Solutions

Why this is Important:

The global parametric market is expected to triple in value in the next decade and captive owners are in the best position to move toward customized solutions. In this session, you will hear from the leaders in the industry to understand not only the basics of what it is and how it works but also how you should be thinking of opportunities for your captive.

The Rise of Parametric Solutions

AGENDA:

What is Parametric Risk Transfer?
How does it work?
Prevalence in industry
Product design - illustrations
Modes of Parametric Coverage delivery

- Captive Utilization
- Accounting for Parametrics
- Actual Policy recovery / Claim Scenario

Risk manager/captive owner example

Description of company and captive
Describe Parametric utilization

Questions/Wrap up

What is Parametric Risk Transfer?

Simplified (re)insurance structure where conditions for payment are defined pre-event occurrence & based on credible measurements or physical conditions

- Event based product rather than an indemnification of an incurred loss (appreciation of basis risk)
- Pre-defined limits will pay-out based on pre-defined terms and event characteristics
- Pay-out terms are set and defined by specific trigger mechanisms
- Triggers are directly related to the peril/event the protection buyer wants to protect against, e.g.
    - ***Earthquake:*** *magnitude, latitude, longitude, depth*
    - ***Hurricane:*** *Wind speed, track*
    - ***Wildfire:*** *Coordinates / area of burn*
- Contract **only pays** when defined trigger mechanisms are experienced and recorded

What is Parametric Risk Transfer?

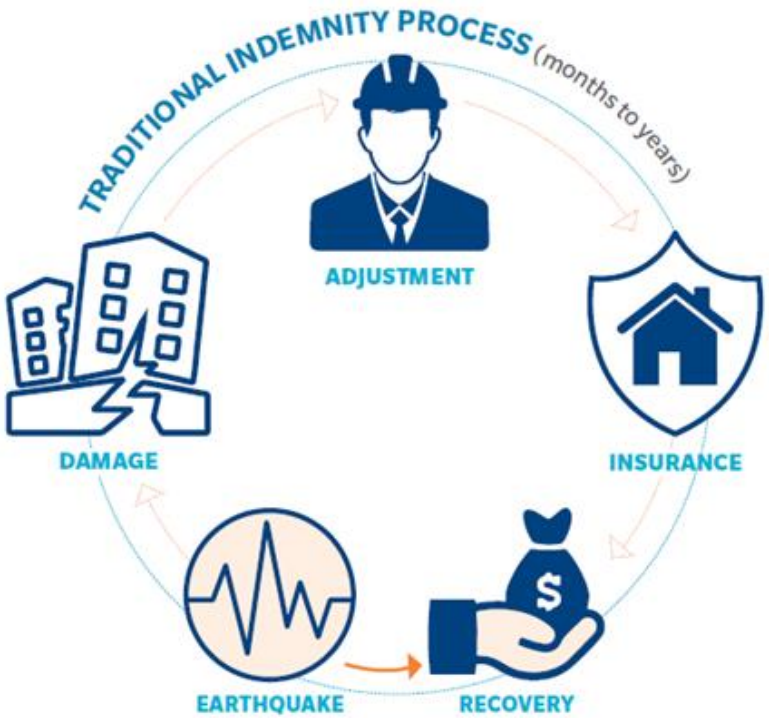
What risks are being transferred…

(including but not limited to)

- Earthquake 
- Cyclonic wind *(hurricane, cyclone, typhoon)* 
- Flood 
- Wildfire 
- Severe Convective Storm 
- Cyber 
- Weather *(drought, snow/rainfall, heat etc.)* 
- Terrorism 

How does it work?

Parametric vs. Indemnity



PARAMETRIC

Parametric Offers…

- ✓ **Speed**: Payments are fast as there is no claims adjusting process
- ✓ **Transparency**: Payments are pre-tabulated in the contract and triggering parameters are reported publicly
- ✓ **Versatility** / holistic enterprise economic loss(es): Freedom to use proceeds as needed with no or very relaxed exclusions and specifications
- ✓ **Customization**: Cover can be designed to guarantee certain levels of payment for desired scenarios

Indemnity Offers…

- ✓ **Precision**: The claims adjustment process ensure recoveries approximate experienced losses

Prevalence in the Industry

- Insurers
- Reinsurers
- Capital Markets(1)
- MGUs
- Modeling firms
- Insurance brokers
- Reinsurance intermediaries

(1) *Not specifically shown. Parametric insurance has been around for over 20 years. Today, it makes up around 15% of issued catastrophe bonds in a $100 billion market.*

Prevalence in the Industry

Interested protection buyers…

(including but not limited to)

- Insurers ***(reinsurance, customer product development/offerings)***
- Reinsurers ***(retrocession)***
- Corporates
- Private citizens
- Government / Public-entity
- NGOs

Prevalence in the Industry

Rationale for exploring parametric coverage

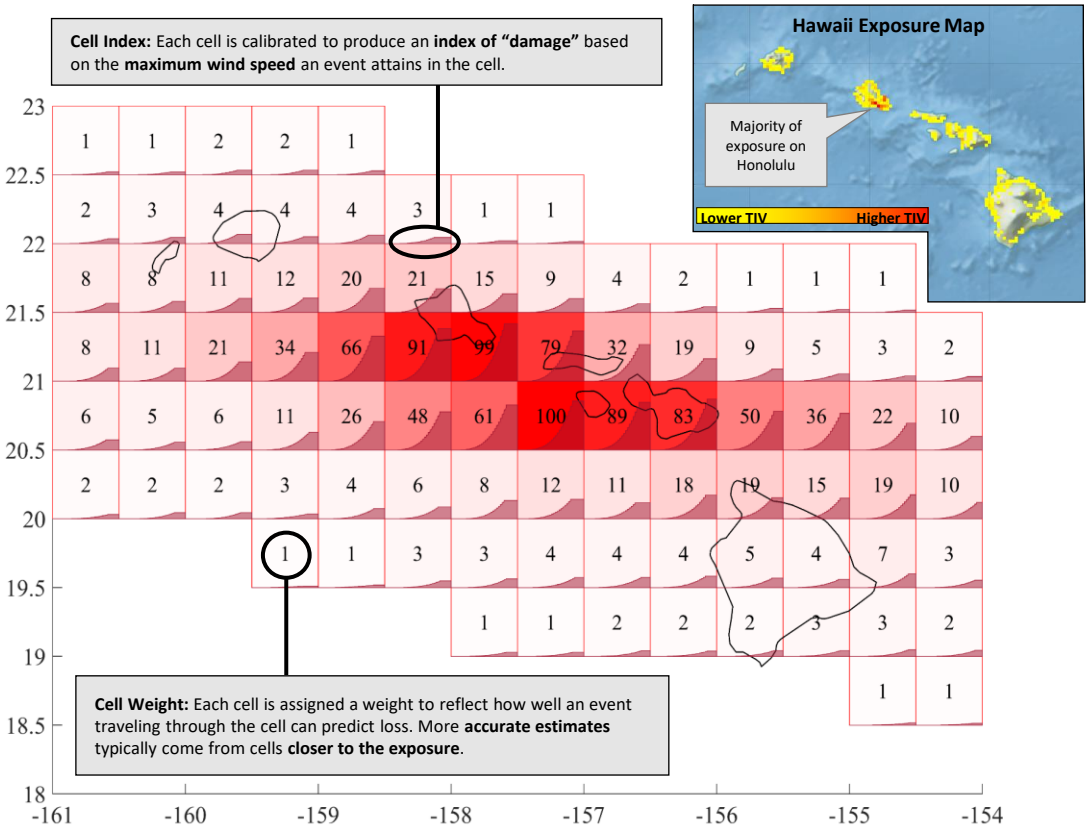
(including but not limited to)

- Increased limits / peril coverage capacity
- Augmentation of existing protections
- Holistic event economic loss protection
- Product / coverage enhancement
- Scarcity of “traditional” capacity / appetites
- Alternative sourcing of capital
- Transparency
- Liquidity / Speed of payment

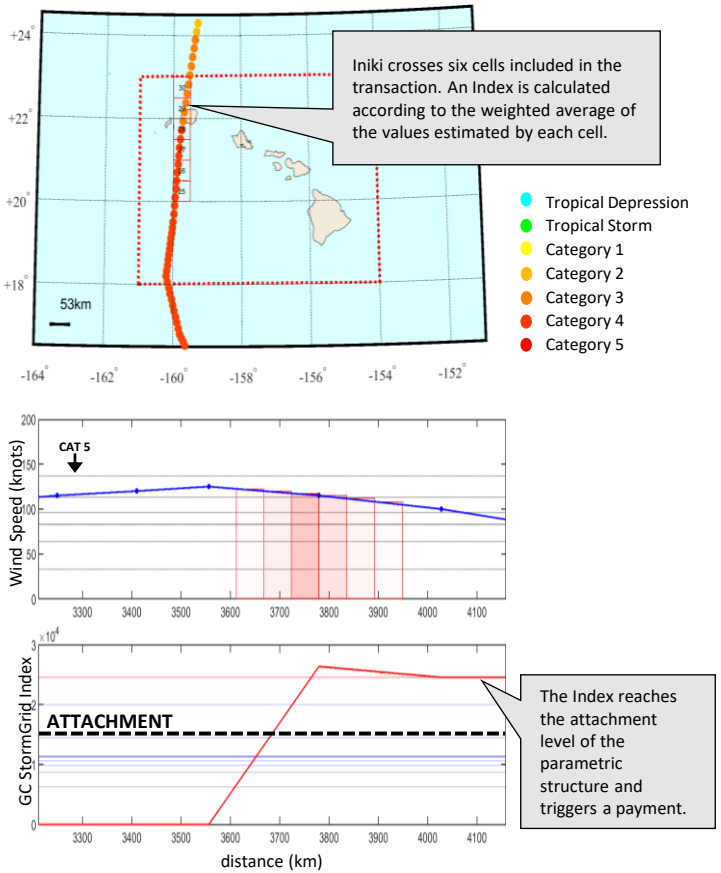
Product Design – Illustrations

GC StormGrid Cyclonic Wind "Cat-in-a-grid" solution provides coverage, with manageable basis risk

Cell Weights & Index Functions Calibrated to Hawaii Industry Exposure



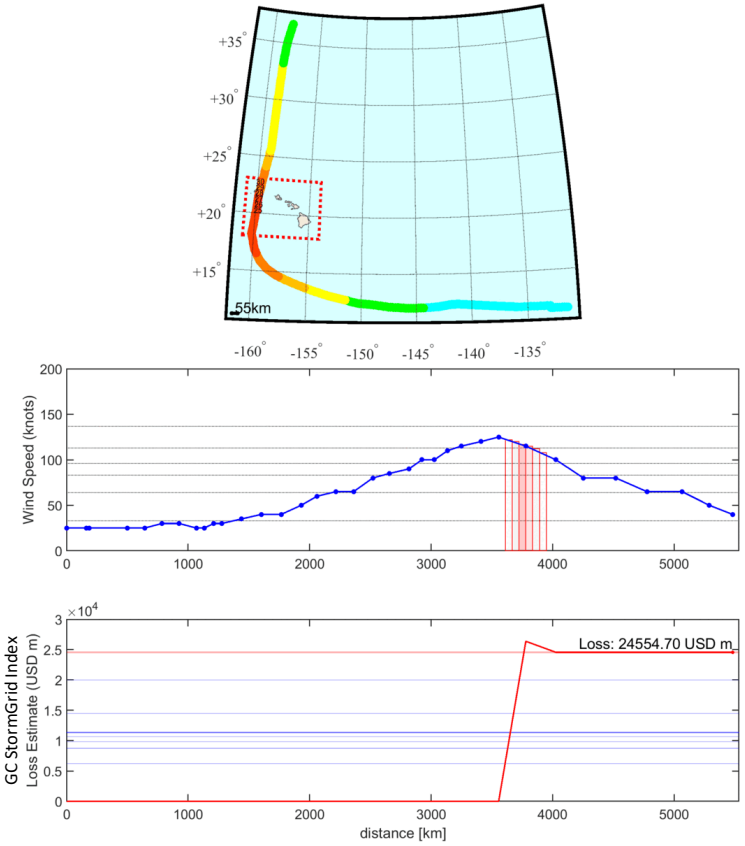
Hurricane Iniki (1992) Case Study



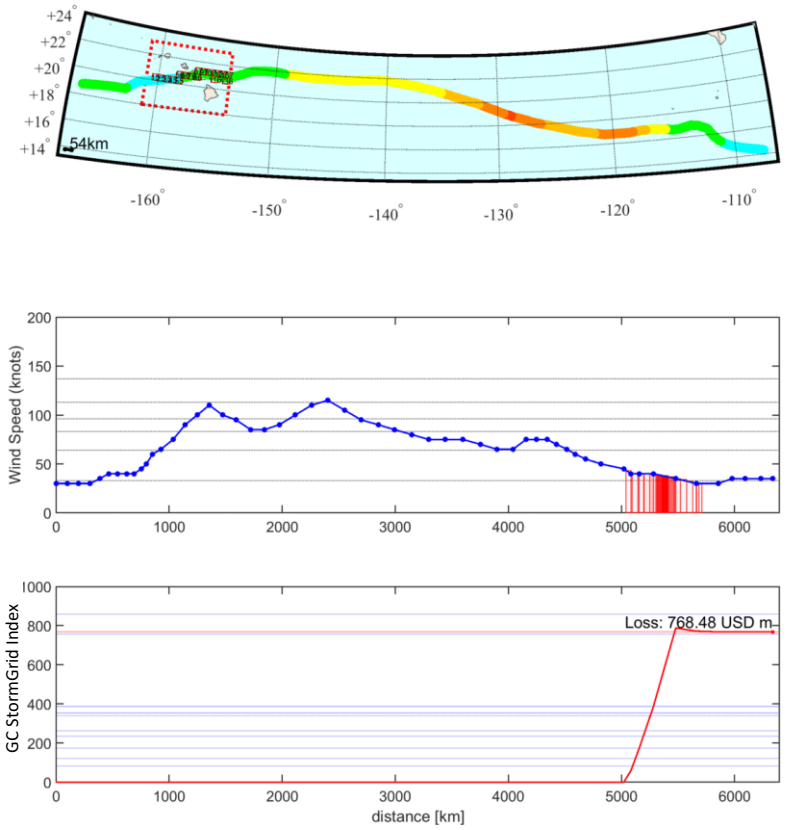
Product Design – Illustrations

Historical Case Studies

Hurricane Iniki (1992) Case Study



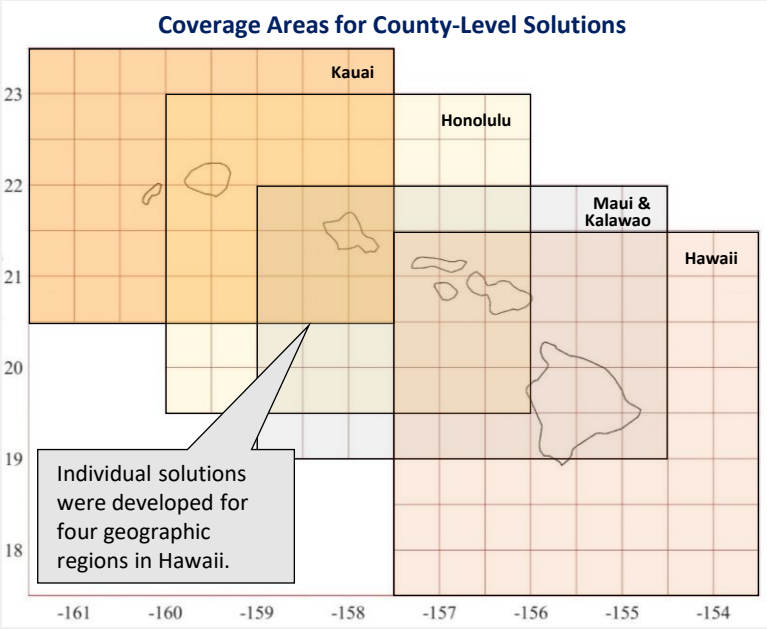
Hurricane Olivia (2018) Case Study



Product Design – Illustrations

Designed to fit client exposure and fill gaps in coverage

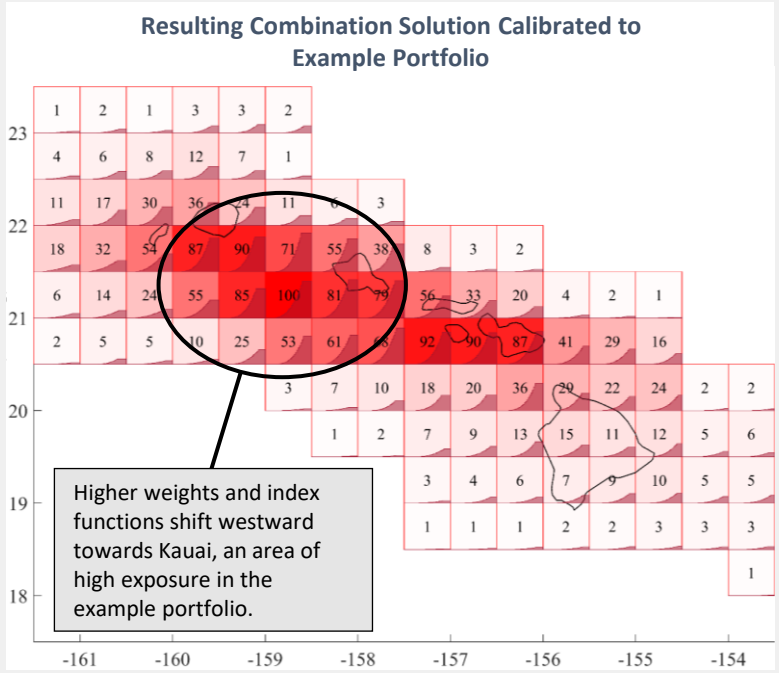
Solutions Calibrated to Client Portfolio



Example Client Portfolio

	County	Aggregated TIV (USD m)
	Kauai	150
	Honolulu	50
	Maui & Kalawao	50
	Hawaii	50

County-level solutions are weighted and combined according to the client portfolio:

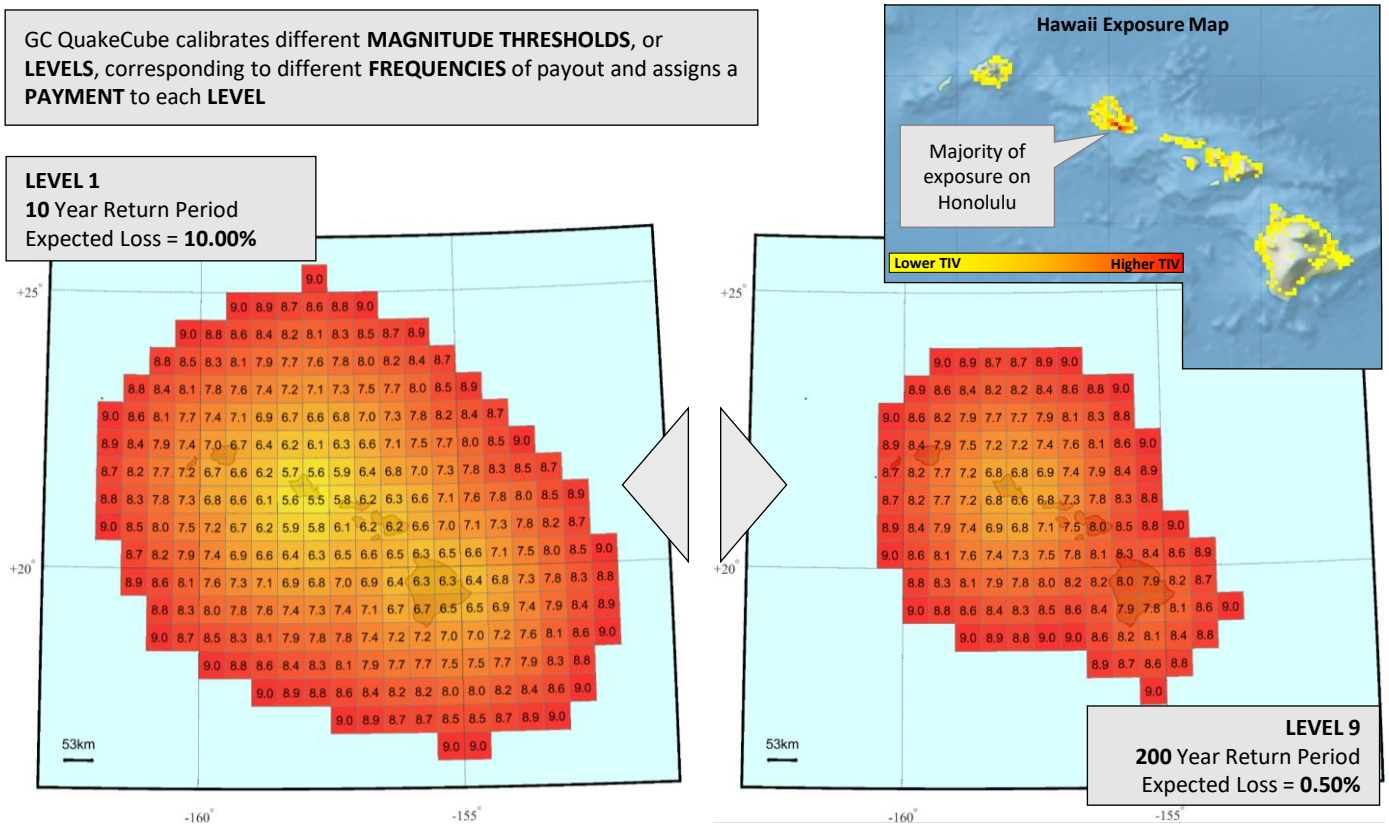


Product Design – Illustrations

GC QuakeCube Earthquake Cat-in-a-box solution provides coverage, with manageable basis risk

Coverage is Tailored to Return Period or Budget

GC QuakeCube calibrates different **MAGNITUDE THRESHOLDS**, or **LEVELS**, corresponding to different **FREQUENCIES** of payout and assigns a **PAYMENT** to each **LEVEL**



Lower Exhaustion
Ample coverage but requires a larger budget

TAILORED COVERAGE

Increased Retention
More restricted coverage for a smaller budget

Product Design – Illustrations

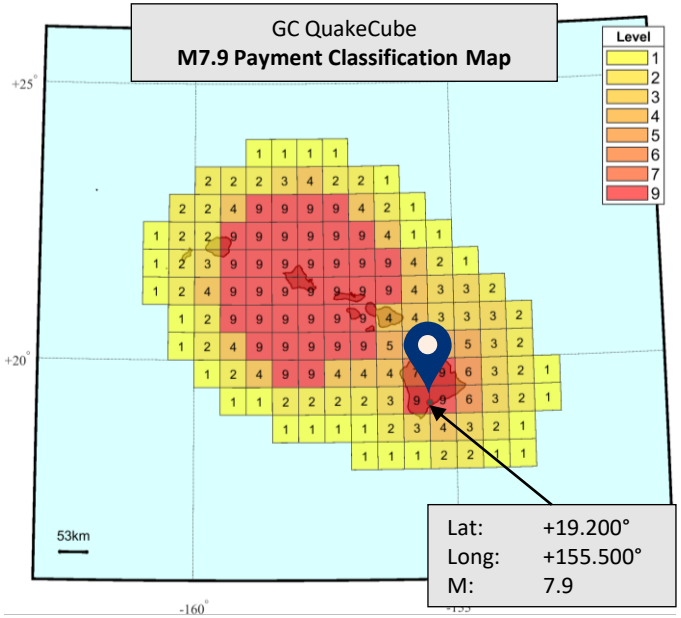
M7.9 Great Ka'u Earthquake (1868) Case Study

1) Pin point the location of the event on the M7.9 Payment Classification Map

2) Assess what payout level would have been triggered

To this historical earthquake scenario would correspond a: Payout **Level 9**

3) Associate a monetary recovery to the payout level



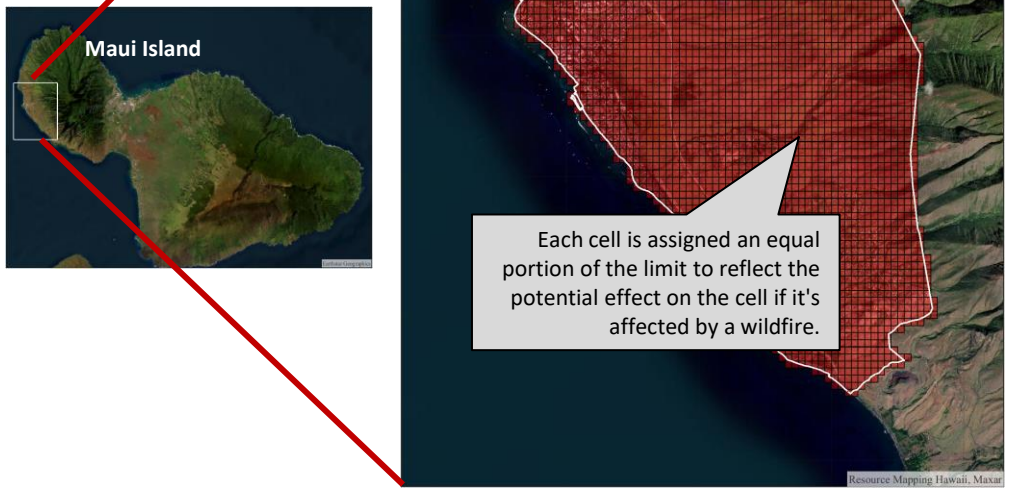
Level	Payout (% of Limit)
9	**100**
8	90
7	80
6	65
5	50
4	35
3	20
2	10
1	5

According to this example payout structure, to a Payout **Level 9** would correspond a payout of **100% of the Limit**

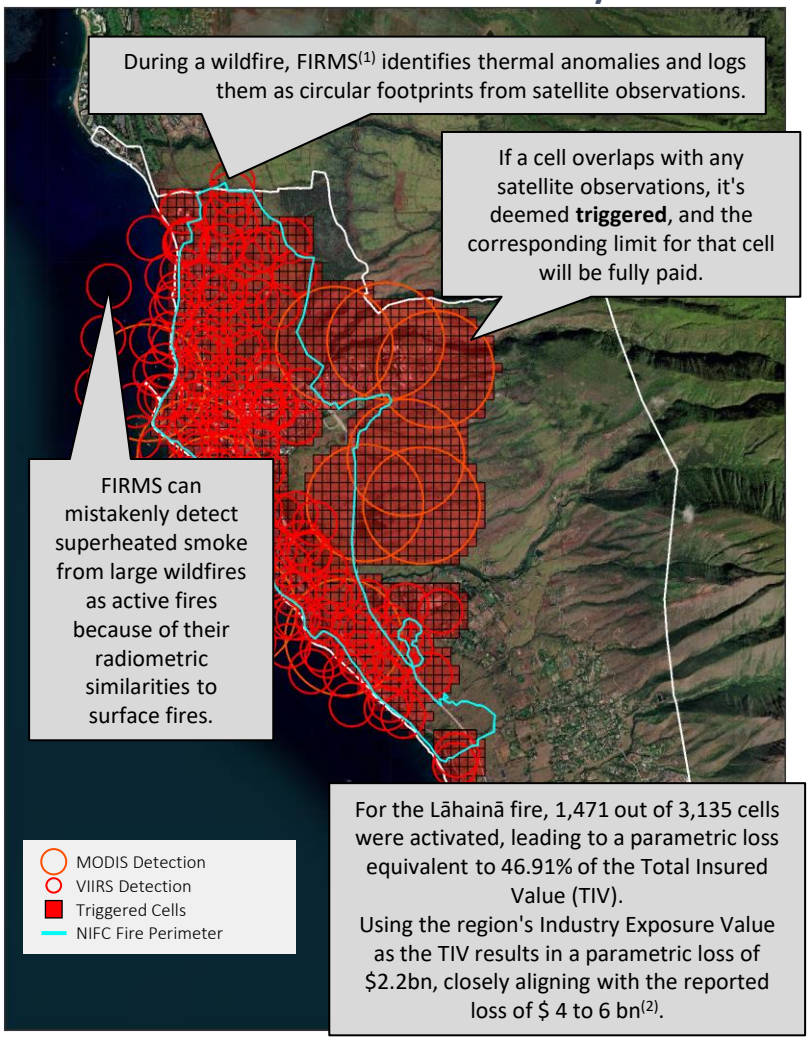
Product Design – Illustrations

GC FireCell Wildfire Cat-in-a-box solution provides coverage, with manageable basis risk

Coverage Area is Tailored to Location of Interest



Lāhainā Fire Case Study



(1) *Fire Information For Resources Management System (FIRMS) provides satellite detections through both MODIS and VIIRS instruments.*

(2) *https://www.guycarp.com/insights/2023/08/lahaina-maui-wildfire.html*

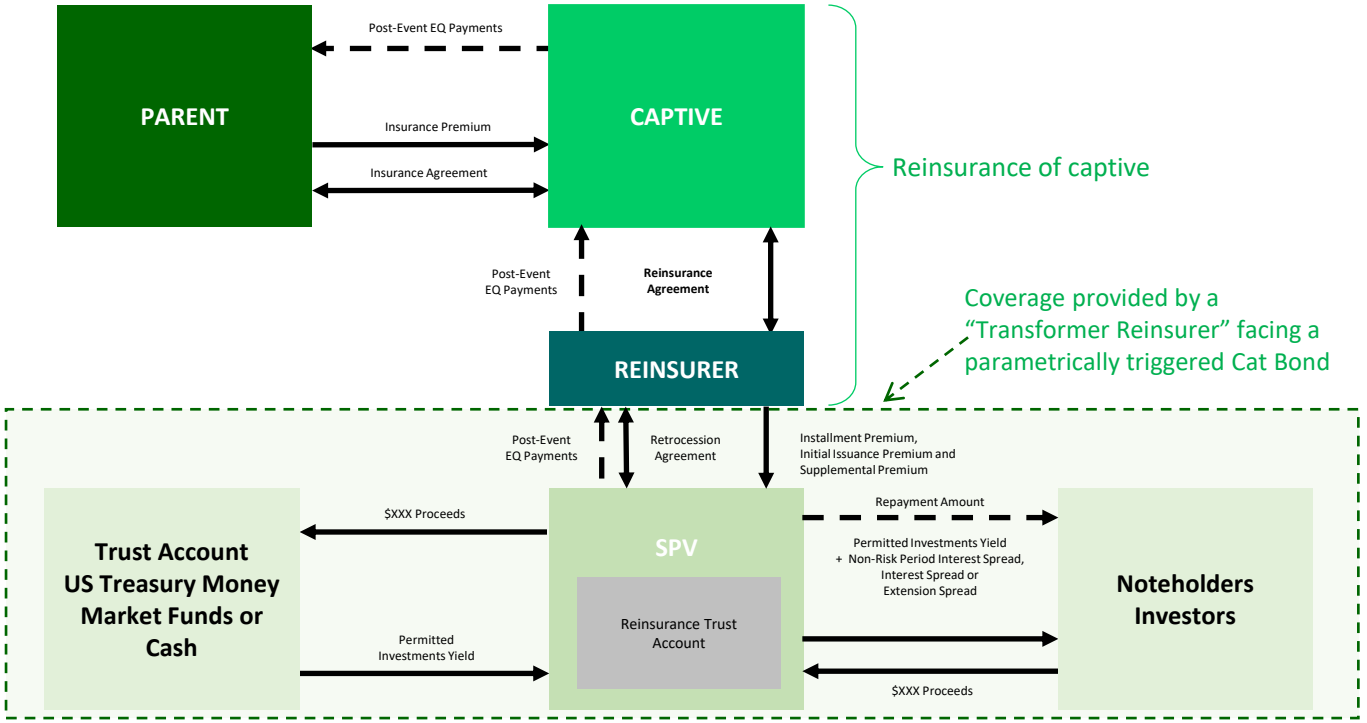
Modes of Parametric Coverage Delivery

Structured as/for Insurance, Reinsurance or Retrocession;

Insurance accounting treatment or derivative forms;

Utilizes Insurance Reinsurance &/or ILS (Cat Bond / Collateralized Re) capacity & forms

Illustrative example(s) of parametric reinsurance coverage provided to the Captive… Direct and inclusive of Cat Bond



Modes of Parametric Coverage Delivery

Actual Policy recovery / Claim Scenario – Typhoon Noru (Sept 2022)

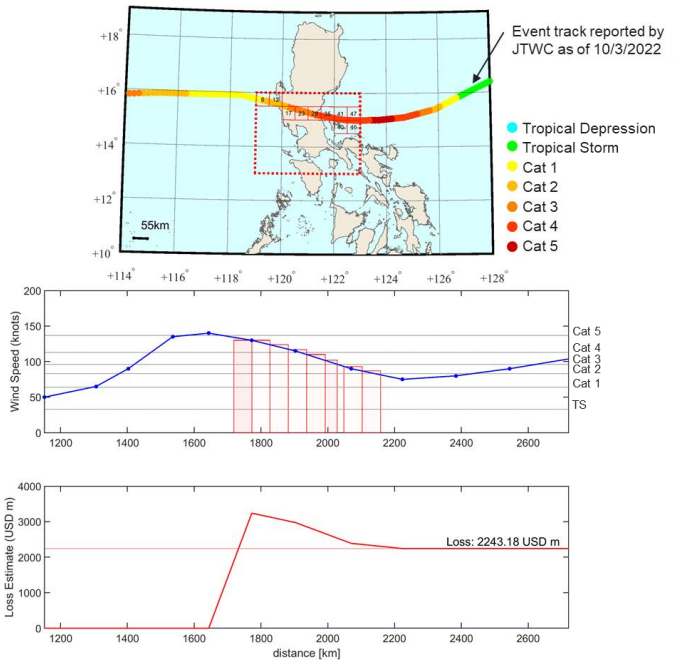
Event Information

GCSG Index: 2,243,179,104

Client Recovery: 19%
(according to contract)

Contract Payout Table

Total Index Value	Payout Rate (%)
>= 4,328,441,868.83	100%
>= 3,483,783,908.73	68%
>= 2,988,475,187.76	45%
>= 2,303,989,859.17	29%
>= 1,397,146,607.47	19%
< 1,397,146,607.47	0%



Sept 2022

- Event (track, windspeeds and contract / Policy response) calculated by GC and verified by the insurer within days of event.
- Policy structure / conditions established a maximum recovery of $4.75m
- Client provided "initial" loss estimate of $2.5m
- Insurer paid $2.5m within **30 days** of Initial loss estimate (**October 2022**)
- After 365 days, client required to provide a final loss (Ultimate Net Loss) to conform with insurance accounting treatment
- Client advised that only just over ~$500k of loss was incurred from the triggering event
- Client refunded the delta/overage between the Initial loss estimate / payment and the Final Loss Payment
- Claim mutually confirmed by client and insurer as being closed and fully settled

Sept 2023

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2023

-Experience from Japan- Parametric EQ Insurance and Captive Solution

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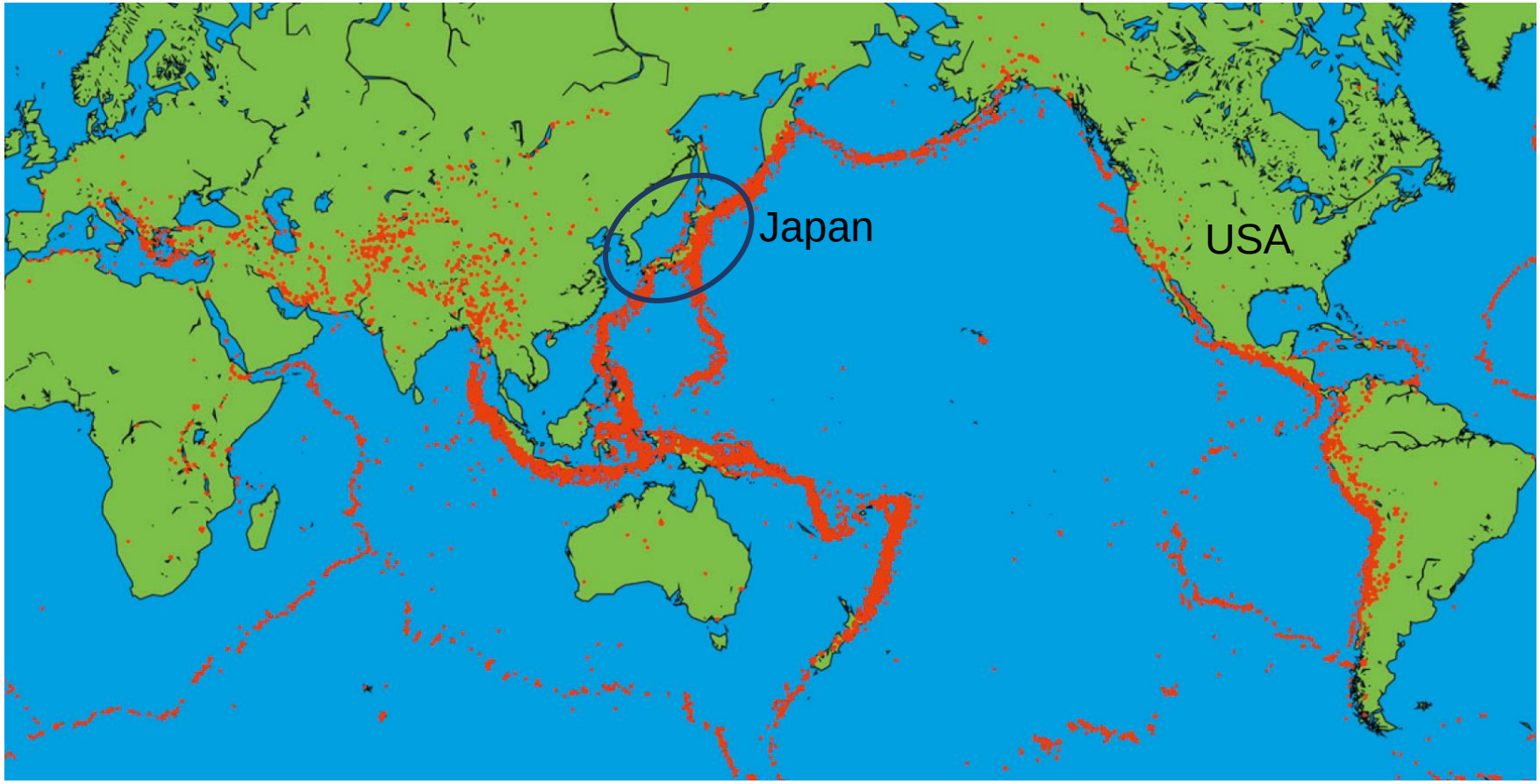
Japan – Intensive Earthquake Risks on Circum-Pacific EQ Belt



Evidence of Japanese EQ Risks

- Economic losses from EQ in the world last 30 years (Total USD1,111 B)

  43% occurred in Japan

  (Source: CIGMA, Swiss Re)

- Major EQ counts over Magnitude 7 in the world last 50 years

1	Indonesia	78	10.5%
2	Papua New Guinea	56	7.5%
3	Japan	49	6.6%
4	Philippines	42	5.6%
5	USA	30	4.0%
	Grand Total	746	

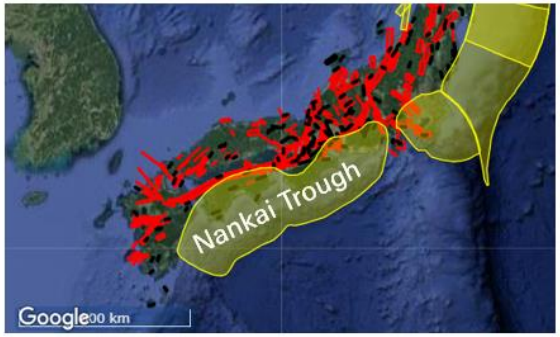
*22 in Alaska

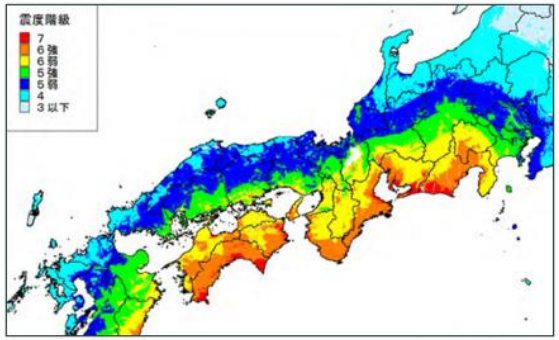
(Source: USGS)

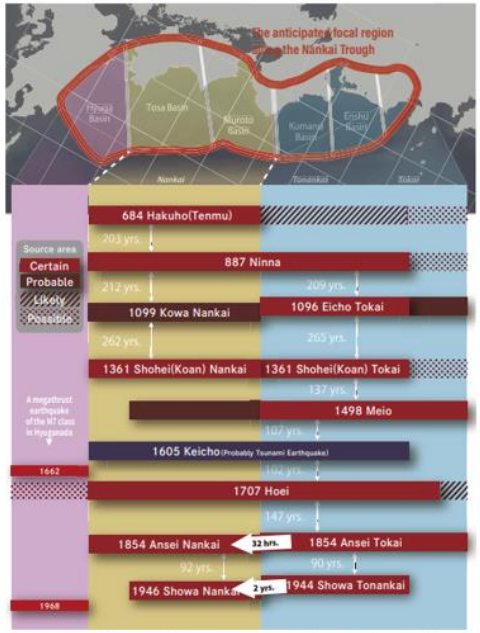
What is the Nankai Trough Earthquake?

source : https://www.jma.go.jp/jma/kishou/books/jishintsunami/en/jishintsunami_en.pdf

- Nankai Trough Earthquakes occur with a cycle of roughly 100-150 years with various repetition intervals and source areas.
- In some cases multiple earthquakes occur within a certain period, and in others most of the trough can rupture at once. About 80 years have passed since the massive 1944 Showa Tonankai and 1946 Showa Nankai earthquakes, suggesting that another may be imminent.
- Seismic intensity i.e. Shindo estimation caused by (next) Nankai Trough Earthquake
  Source : Cabinet office, government of Japan







▲ *Time sequence and source areas of historical Nankai Trough Earthquakes*
Modified from a December 2018 report by a working group set up under the Central Disaster Management Council

Economic damage (an estimate) caused by The Nankai Trough Earthquake

The Nankai Trough Earthquake would cause economic damage up to approximately 215 trillion yen in total which is around 10 times greater than the damage caused by the Tohoku Earthquake 2011 and more than double the governmental of Japan's annual budget.

[Breakdown of the estimate]

1. Damage of buildings and assets in affected areas
   Approximately 170 trillion yen in total
2. Affects on economics activity – nationwide
   Approximately 45 trillion yen

Approximately

215

trillion yen
in total

Source : Cabinet office

USD1.5 trillion

TERUMO

Japan's leading medical device manufacturer/distributor (102 years old)

- Global sales JPY820 bil. (USD5.7 bil), sold in 160+ countries
- Sales breakdown: 35% Americas, 25% Japan, 20% EMEA
- Operating profit JPY117 bil. (USD836 mil.) Profit margin 14.3%
- Manufacturing/R&D in Japan still critical

(As of March 31, 2023)

Challenge: Our main plants in Japan are located in EQ hot zone

Landscape of Japanese EQ insurance markets

Limited capacities

Extremely high prices

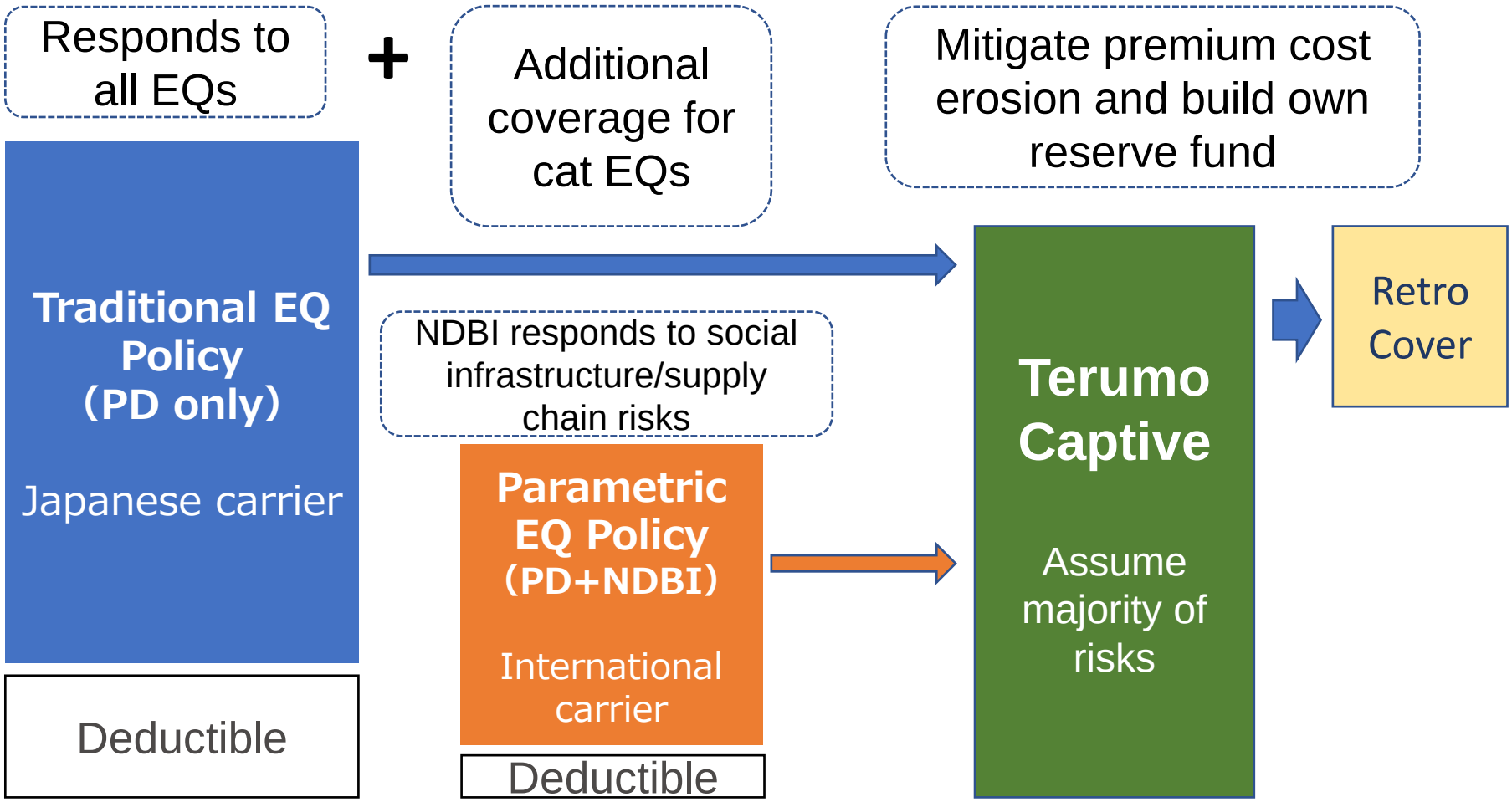
Very few players

Indemnity payout process takes 1-2 yrs. for catastrophic EQ

Hard to obtain EQ-BI

Terumo needed a different solution

Unique Hybrid EQ Insurance Program



Mahalo.
This concludes our presentation.