



March 13–15, 2023

San Diego, CA

Loews Coronado Bay Resort

Ratemaking, Product and Modeling Seminar



Underwriting a Greener Future and ESG+R



“Identify the most severe risks on a global scale over the next 10 years”

■ Economic ■ Environmental ■ Geopolitical ■ Societal ■ Technological



Source: World Economic Forum Global Risks Perception Survey 2021-2022

Over 65% of respondents believe “extreme weather” will become a critical threat to the world within the next five years.



Global Risks Perception

WORLD
ECONOMIC
FORUM



Global Risks Perception

- **Extreme weather** leads to loss of human life, damage to ecosystems, destruction of property and/or financial loss at a global scale as a result of: cold fronts, fires, floods, heat waves, windstorms etc.
- **Climate action failure:** Governments and businesses fail to enforce, enact or invest in effective climate-change adaptation and mitigation measures, preserve ecosystems, protect populations and transition to a carbon-neutral economy.

ESG



Environmental

- Renewable fuels
- Greenhouse gas (GHG) emissions
- Energy efficiency
- Climate risk
- Water management
- Recycling processes
- Emergency preparedness



Social

- Health and safety
- Working conditions
- Employee benefits
- Diversity and inclusion
- Human rights
- Impact on local communities



Governance

- Ethical standards
- Board diversity and governance
- Stakeholder engagement
- Shareholder rights
- Pay for performance

ESG measures businesses' environment, social and governance credentials – but is that enough? Image: Valero

“ESG is missing a metric: R for resilience”
-- World Economic Forum



ESG+R



NATIONAL
ASSOCIATION OF
REALTORS®
SUSTAINABILITY PROGRAM

ESG + R REPORT



ESG+R

- **Resilience** allows consumers to make better, more informed decisions about the risks and costs of insuring a property—now and in the future.
- Flood Factor on Realtor.com – Realtor.com now includes flood risk data from Flood Factor on each listing to help **assess flood risk on individual properties.**
- NAR Smart Growth Grants and Placemaking Program support state and local associations in the creation of parks, trails, and community gardens. The natural surface of these types of projects enhances stormwater absorption, and the gardens can **provide a source of food in times of need.**
- NAR policy supports Risk Rating 2.0: Equity in Action, which prices flood insurance for **each home individually rather than by flood zone.**



Regulatory



TCFD

TASK FORCE ON
CLIMATE-RELATED
FINANCIAL
DISCLOSURES

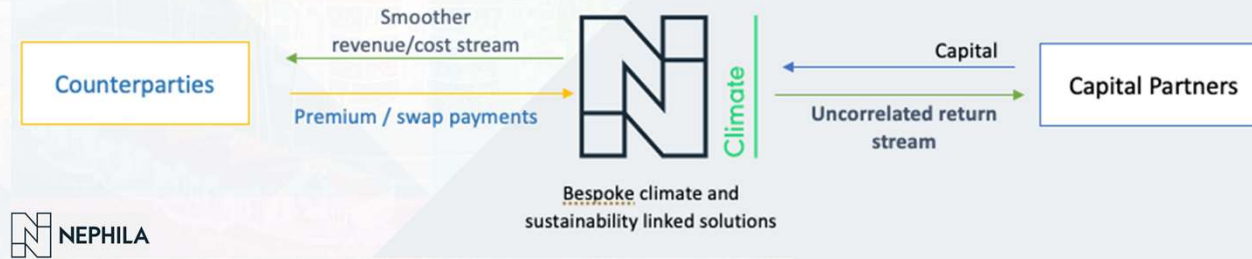


Regulatory

“Specifically, we are proposing that impacts on any relevant line item in the registrant’s consolidated financial statements during the fiscal years presented arising from severe weather events and natural conditions, and the identified physical risks (collectively, “climate-related events”), would **trigger the proposed disclosure requirement discussed below. Specific examples of such severe weather events and natural conditions** may include the following: Flooding, Drought, Wildfires, Extreme Temperatures, and Sea Level Rise”



Risk Transfer Creates Resilience



Probabilistic Inputs	Production Process Uncertainties	Failure Modes 	Project Financials
Model Logic & Simulation		Fast Monte Carlo simulations, modern platform (AWS + Python)	
Aggregate Output			

NEW ENERGY RISK



Today's Discussion

Sherry Huang, Chief Actuary and Managing
Director of Underwriting Development,
New Energy Risk

Jaesung Park, Head of Research,
Nephila

Matt Coleman, Chief Risk Officer,
The Demex Group



Products



NER's Mission: Accelerate the Deployment of Breakthrough Technologies

- New Energy Risk (NER) is an MGU founded in 2010. Since 2022, New Energy Risk is a wholly-owned division of Paragon Insurance Holdings
- NER leverages engineering expertise, technoeconomic risk model, and relationships in the insurance industry to offer a **technology performance insurance** solution that **unlocks financing** for breakthrough technologies
- NER is **Underwriting a Greener Future™** — NER's bespoke solution facilitates efficient financing for energy transition positive technologies
- Coverage are typically 2 -15 years, and \$5m-\$200m capacity per project
- NER has supported **\$3.0B** in capital investment, helping breakthrough technology:



**Access
Efficient Capital**



**Accelerate
Time to Market**



**Achieve
Commercial Scale**



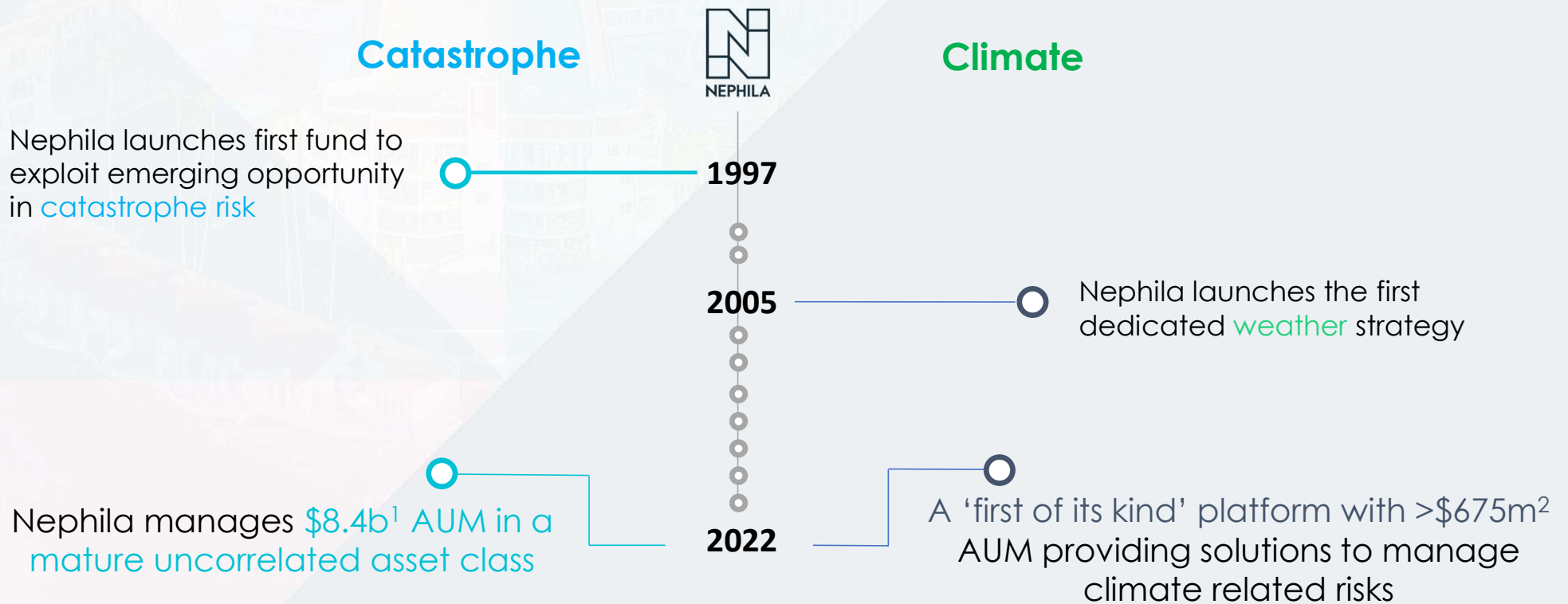
NER's Core Product: Technology Performance Insurance

Technology Performance Insurance benefits project developers and technology developers, and enables the insurance industry to participate in energy transition from the liability side of the balance sheet



Nephila sees and meets the opportunities

Over 20 years of improving efficiency in the risk transfer markets

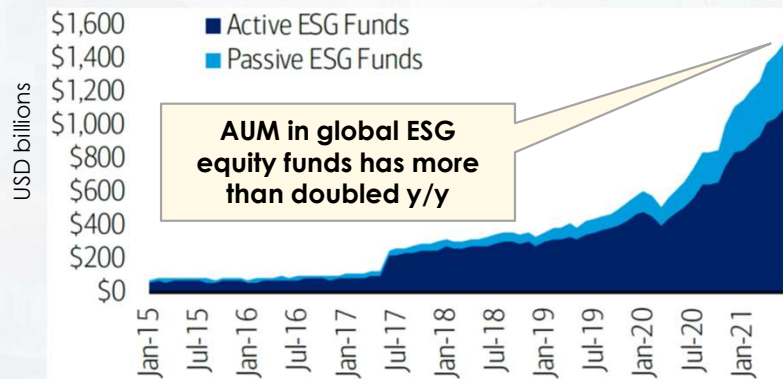


Momentum from global focus on ESG

Opportunity has come in equity and credit markets...

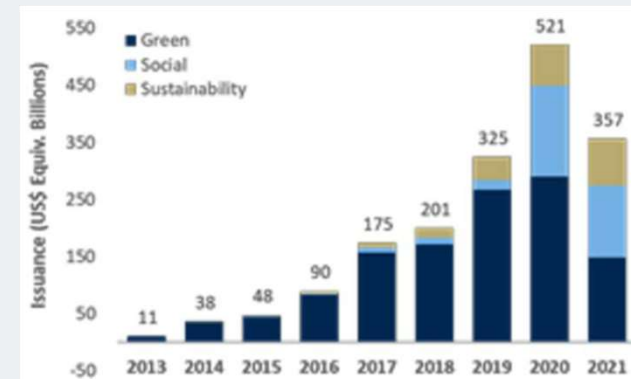
Equity Markets¹

Assets under management in global ESG equity funds (1/2015-6/2021)



Credit Markets²

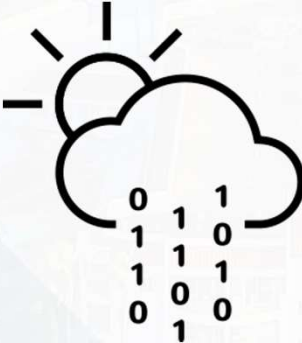
2020 GSS Bond Issue



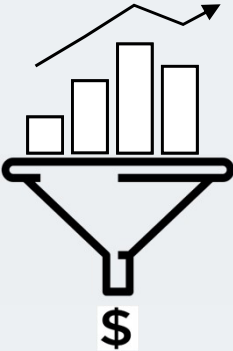
...risk transfer market is next



Demex is a tech-enabled MGA



Weather Modeling
(secondary perils)

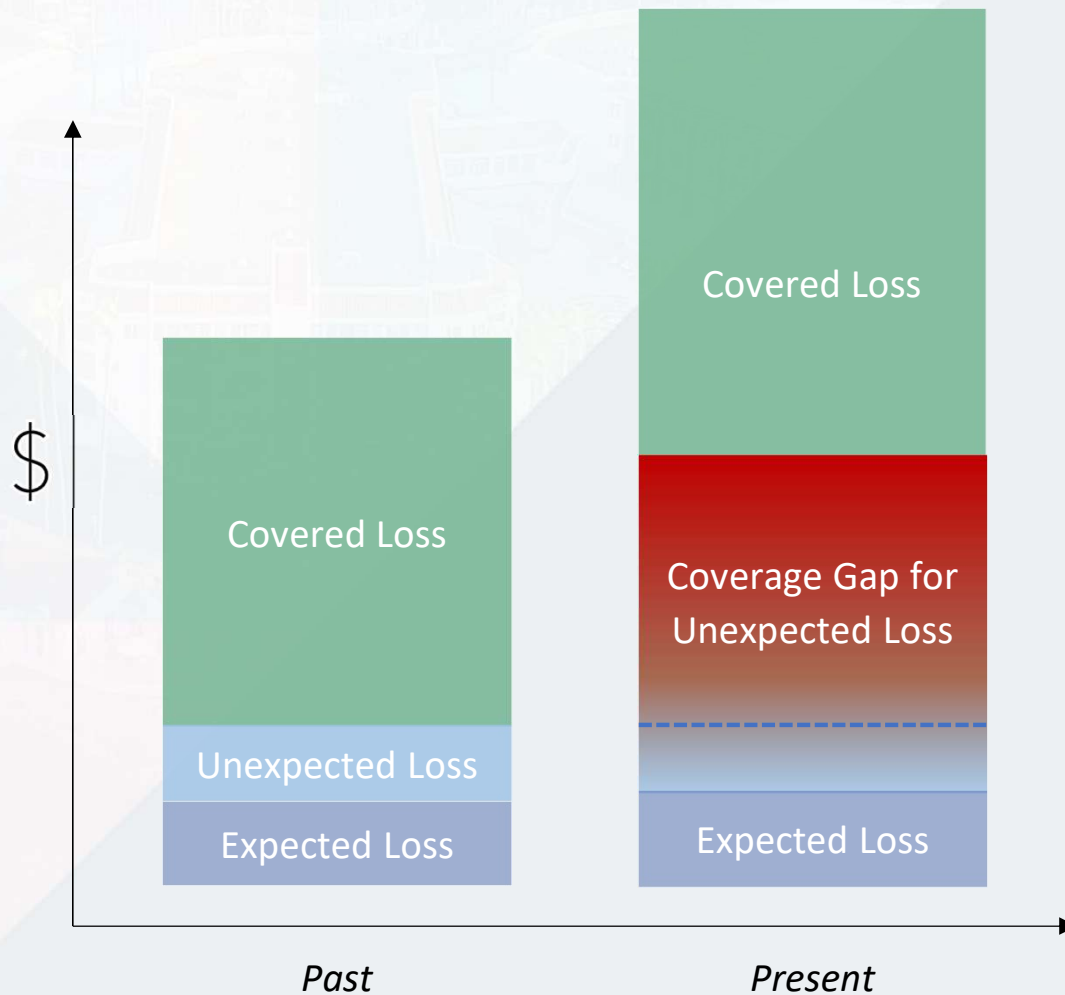


Data Science
**(client-calibrated
parametrics)**

Risk Capacity Network



Climate change is the #1 threat to the global economy



Non-catastrophic weather losses are accumulating faster now than anytime in world's economic history. They now account for 60% of total losses.



Risk transfer increases financial resilience to climate change



Diagnose client-specific financial pain points related to weather



Price & transfer client-specific weather risks through the Demex Risk Capacity Network



Process



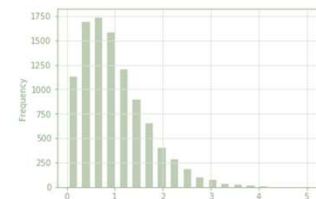
Technology Performance Insurance Risk Assessment

NER assesses performance risk with thoughtful inputs and simulation platform from the ground up

Probabilistic Inputs

Production Process Uncertainties

Failure Modes



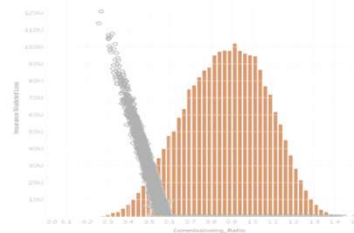
Project Financials

Supported by pilot data, industry data, expert judgement and technical advisor reviews as needed

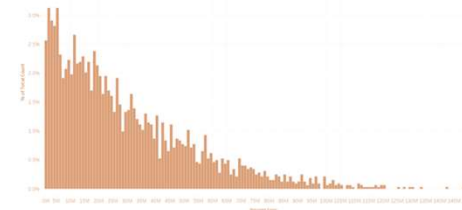
Model Logic & Simulation

Fast Monte Carlo simulations, modern platform (AWS + Python)

Aggregate Output

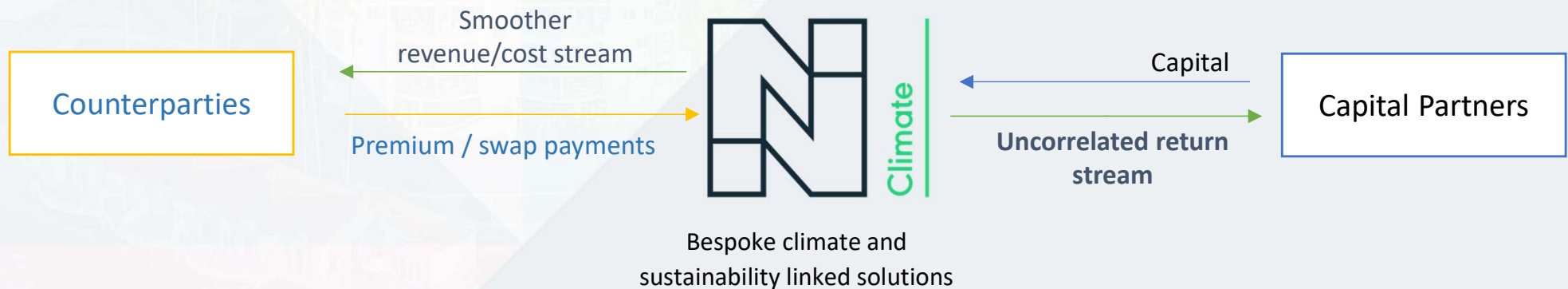


Modeled Loss Histogram



Climate insurance as an uncorrelated return stream

- Counterparties are willing to pay a premium to remove climate-linked revenue or expense volatility
- (Re)insurance contracts as investments are different from debt and equity investments



Nephila Climate strategies benefits from low correlation to traditional, alternative and other catastrophe ILS investments



The investible universe is expanding



Corporates (and Insurers) are willing to pay for customized parametric protection

Retained Climate Risk Reinsurance (RCR Re)

Coverage for insurers' traditionally retained losses is custom calibrated to their individual claims

Target: Insurance carriers

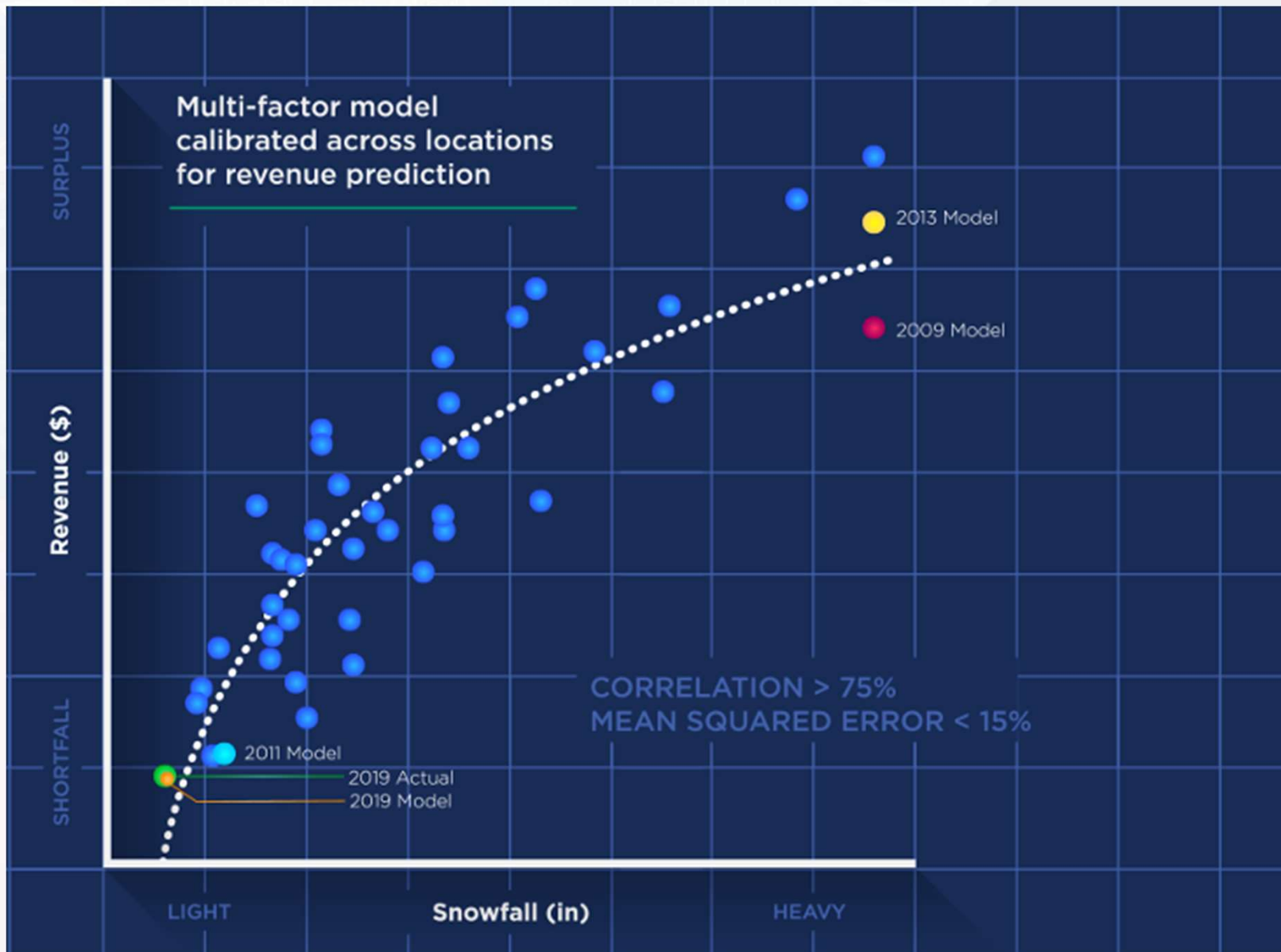
Operational Climate Risk Covers (OCR)

Localized solutions are calibrated to customer financials and mitigate unexpected weather-related costs and lost revenue

Target: Fortune 1000 companies



Client-calibration of parametric indexes facilitates execution of innovative risk transfer products



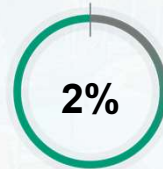
Case Studies



Case Study:



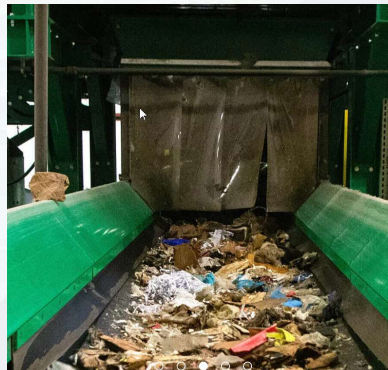
- **Business:**
Municipal solid waste turned into ultra-low sulfur diesel and jet fuel
- **Challenges:**
Difficulty in securing project financing; Banks hesitant to lend due to the perceived risks of a new project
- **Solution:**
NER partnered with Fulcrum BioEnergy to secure over \$175m in green bond financing its Sierra BioFuels Project
- **Coverage for:**
Commissioning risk - Meet warranty obligations and guarantee a level of production sufficient to meet debt service
- **Key Partners:**
Waste Management, United Airlines, BP



Annual Interest Rate Savings



Total Project Savings



From Trash to Cash:
The Sierra BioFuels Feedstock Processing Facility (Reno, Nevada)



Waste Recycled



Fuel Produced*

(80% carbon emission reduction compared to the production of traditional jet fuel)

“If you have innovative technology but you’re having trouble convincing financiers to support you, **New Energy Risk is the partner you need to bridge that gap.** They have the engineering prowess to understand what you’re trying to do and the translational skills to pull the financial implications from the technical risk—and they’re able to do it better than anyone else I know.”



Jim McDermott
Founder & Executive Chairman
Fulcrum BioEnergy



Case Study: Renewable projects require protection against weather linked revenue variability

Revenue for renewable energy projects are influenced by several factors which are driven directly or indirectly by weather:



Volume: how much energy the project produces



Timing: when the project produces energy



Price: amount received for each MWh produced

Traditional revenue contracts with utilities and commodity trading banks do not protect projects from timing and volume risk

This has made it difficult for projects to accurately predict future revenues, which can impede access to financing



Managing climate risk for renewable energy developers

2017

Our first renewable transaction executed with a Texas wind farm



2018

Five new US wind farm transactions. New demand for wind and solar deals in Australia



2022

Globally diversified portfolio of 30+ transactions in wind, solar, & hydro. Strong pipeline of new opportunities

Counterparty

Wind energy project

Challenge

Revenue uncertainty drives **higher cost of debt financing**

Climate or weather risk

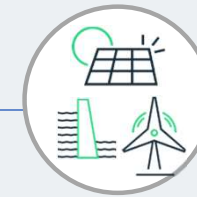
Variable project revenue driven by **variable wind speed** and **uncertain timing** of wind energy generation

Potential Solution

Proxy Generation Swap; Project owner shares revenue upside in exchange for transferring revenue downside

Added benefit

Our products offer an alternative and more leverageable flow of capital to renewable development than direct debt or equity investment.



Hedging products aim to smooth variability and timing of energy production for project developers and create more financing solutions for developers

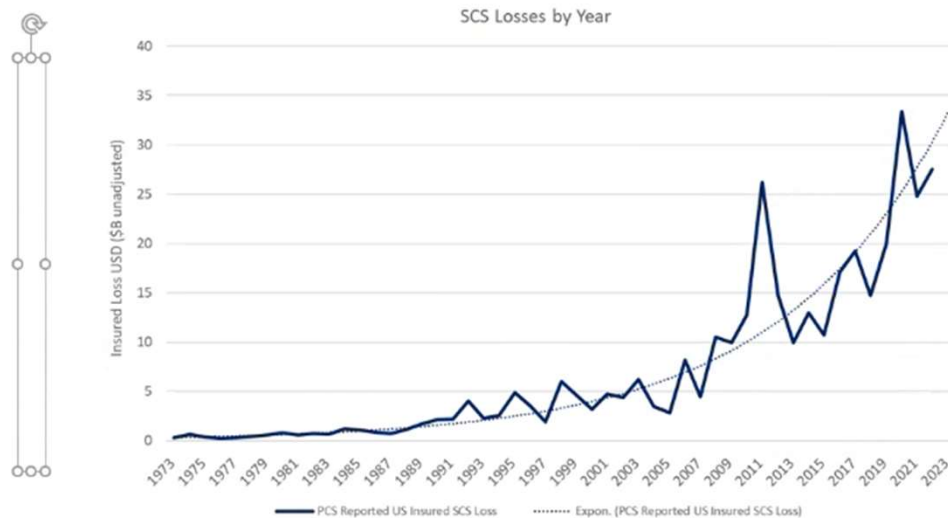


Case Study: Reinsuring surplus volatility due to severe convective storms



EXPONENTIAL GROWTH IN LOSSES FROM SCS

Simultaneous changes in weather, exposure growth, and inflation make predicting SCS loss costs difficult



30-yr avg: \$11bn

10-yr avg: \$19bn

5-yr avg: \$24bn

2023 (Trend): \$30-35bn



Touchstone 9.0 US AAL: \$18bn

Touchstone 10.0 US AAL: \$28bn

Source: PCS, Verisk Global AAL Report, Verisk AIR Touchstone

1



Case Study: Reinsuring surplus volatility due to severe convective storms

Problem

- Excessive extreme weather events (wind, hail) in the Midwest in 2022
- Insurance carriers deplete reinsurance and must increase reserves
- Tens of millions in retained losses lead to credit downgrades

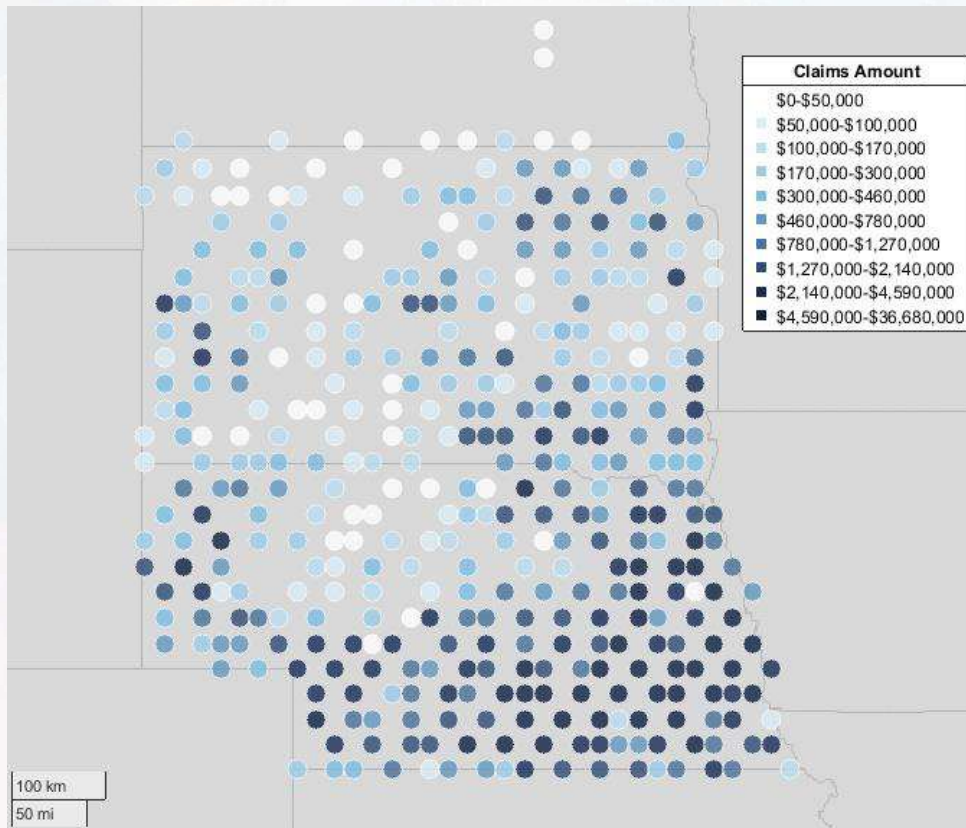
Solution

- Proprietary model calibrated to client's claims
- Bespoke parametric reinsurance solutions (\$50 million in coverage for a single customer)
- Stabilize balance sheets, reduce risk of credit downgrades

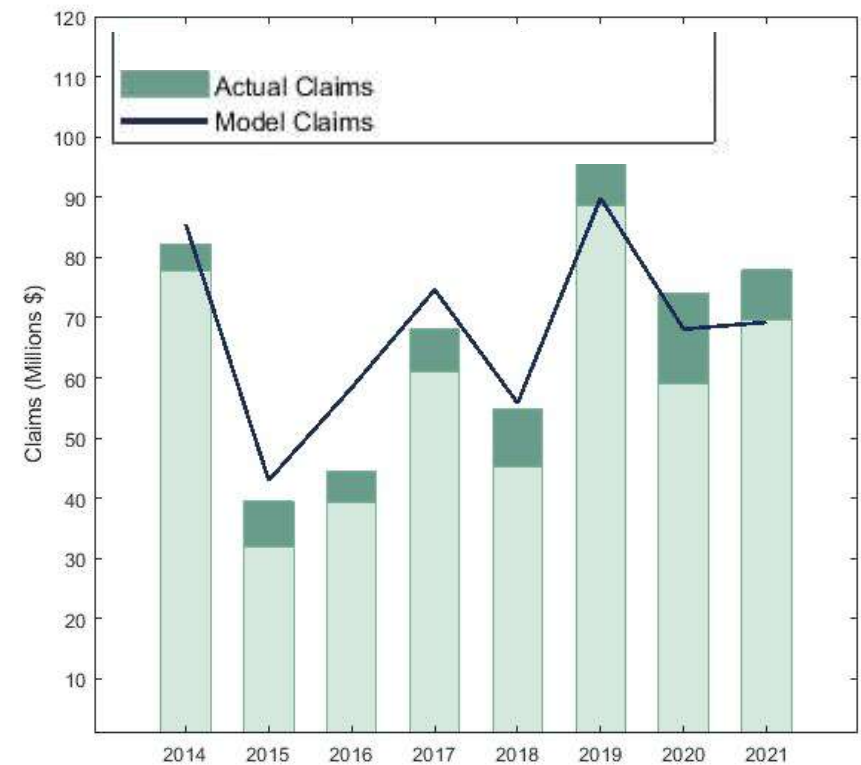


Case Study: Reinsuring surplus volatility due to severe convective storms

Gather climate and claims data



Model climate-driven claims



Discussion

