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The Impact of Scientific Research, Artificial Intelligence and International Law on Climate Change





Climate Risk Management and Regulatory Solutions

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CEO, YoujiVest



Global Economic Losses

Notable 2024 Economic Loss Events



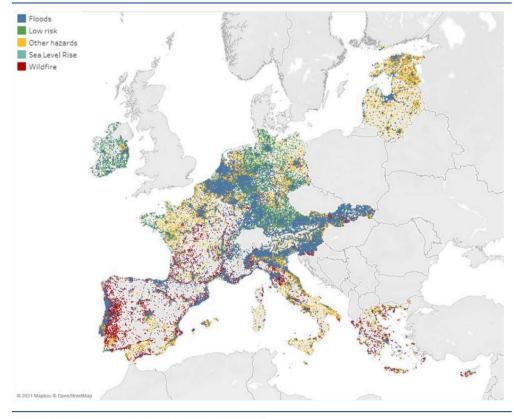
Economic losses from global natural disasters in 2024 are estimated at \$368 billion, about 14 percent above the long-term average since 2000.

Losses in emerging markets such as Brazil, India and China are accounting for an increasing portion of the global toll due to the rapid economic growth and urbanization in high-risk areas in recent years.



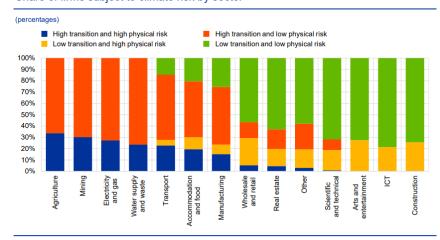
ECB Climate Risk Stress Test Result

Physical risk: intensity and sources across European regions



Source: ECB calculations based on Four Twenty Seven data (2018).

Share of firms subject to climate risk by sector



Source: ECB calculations based on Four Twenty Seven and Urgentem data (2018).

Notes: Firms are categorised as vulnerable to high transition risk if their relative emissions fall into the 70th percentile of Scope 1, 2 and 3 relative emissions for the entire sample. Firms are vulnerable to high physical risk if their probability of suffering from a wildfire or a river or coastal flood in a given year is over 1%. Level 1 NACE sectors are shown.

The probability of default of high-physical risk firms is projected to increase by 2050 by almost 25% under the hot house world scenario, Climate related portfolios with default possibilities five times higher than 2020, subjects to 43 trillion Euro assets. **ECB 2021 Sept**

The Financial Services Agency (FSA) has already introduced a range of Japan mandatory climate disclosure rules into the nation's corporate governance code since mid-2021. The FSA and the BOJ, in collaboration with three major banks, conducted the second scenario analysis on climate-related risks in 2025.



Regulators Mandate Climate Risk Disclosure

Global:

On March 21, 2022, the SEC issued for public comment a proposal to amend its rules under the Securities Act of 1933 and the Securities Exchange Act of 1934 to require public companies (including KeyCorp) to provide detailed climate-related information in their registration statements and periodic reports.

FINAL RULE Copy Link The Enhancement and Standardization of Climate-**Related Disclosures for Investors Public Comments** Guidelines for Banking Sector Climate Risk Stress Test VIEW RECEIVED COMMENTS Overview The Securities and Exchange Commission ("Commission") is adopting rules under the Securities Act of 1933 ("Securities Act") and Securities 1934 ("Exchange Act") that will require registrants to provide certain information in their registration statements and annual reports. The fi require information about a registrant's climate-related risks that have impacted, or are reasonably likely to have a material impact on, its busi perations, or financial condition. In addition, under the final ated to severe weather events and other natural condit udited financial statements

Local requirements:

- The HKMA ran the Climate Risk Stress Test 2.0 (CRST 2.0) with strong support from the banking industry to assess how banks would perform under both short-term and long-term climate risk scenarios.
- In 2024, As compared to the pilot exercise, there are several major enhancements in 2023-2024 CRST in respect of climate scenarios, assumptions, assessment approaches and reporting requirements from HKMA
- In 2024, The Hong Kong Stock Exchange (HKEX) has proposed making climate related disclosures mandatory for all issuers, requiring reporting using the International Sustainability Standards Board (ISSB) standards, from 2025.
- In 2022, The HKEX requires all listed companies and asset management firms to disclose environmental risks in accordance with the TCFD framework no later than 2025
- In **2022**, the Securities and Futures Commission (SFC) of Hong Kong introduced Climate Risk Disclosure requirements
 - On September 30, 2022, the Shenzhen Financial Regulatory Bureau required all local financial institutions to submit environmental risk disclosures no later than June 30, 2023.

In 2022, the China Banking and Insurance Regulatory Commission issued green finance guidelines for the banking and insurance industries



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Climate Risk Pricing Is Crucial For EVERY ASSET!

Current climate risk model Issues

Limited scope

Limited extreme weather events

Uncertainty in climate change

Unable to handle uncertainty in climate change scenario generation

Data availability

Only headquartered location risk

Lack of historical hazard data

Poor local coverage

Low Resolution

Most of the climate models are based on country level

Lack of flexibility

Frameworks inflexible, difficult for organizations requirements adaptation

















- IPCC 7 RCPs and 5 SSPs Pathway scenarios, as well as NGFS scenarios.
- All company subsidiaries, operational locations
- Full coverage in Hong Kong, China, Asia, Global model
- 5x5m resolution, with altitude choice
- Fully customisation (loss curve, assets location, duration, short-term/long term time-interval)





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YoujiVest Solutions

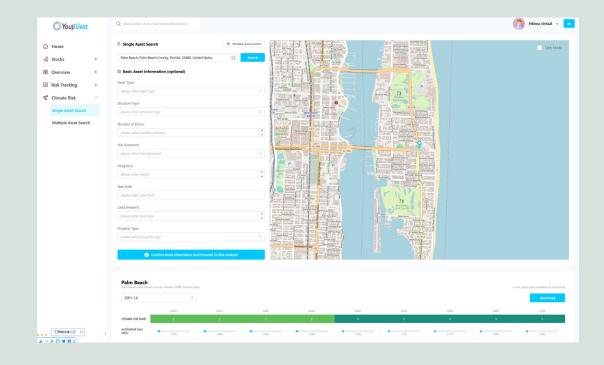
Core Models and Technologies

YoujiVest Climate Risk Model Solutions

-YoujiCRMS

YoujiVest CRM platform provides comprehensive Physical Risk and Transition Risk analysis based on the actual asset locations.

Identify the risks that climate change brings to your business and prepare a risk management plan that deals with climate change





YoujiCRMS Outputs

YoujiCRMS outputs produce scenario analyses that display the Expected Annual Impact. It provides comprehensive climate risk assessments for companies under various scenarios, including physical, policy, and transition risks.

YoujiVest covers all IPCC 7 RCPs and 5 SSPs Pathway scenarios, as well as NGFS scenarios.

SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0, SSP5-8.5 Net Zero 2050, Below 2°, Divergent Net Zero, Delayed Transition, NDCs, Current Policies

A series of hazards can be analysed via CRMS:

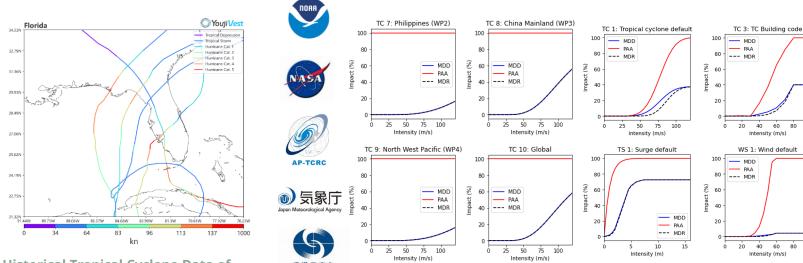
Water Stress, Tropical Cyclones, Floods, Extreme high temperatures, Extreme low temperatures, Wildfires, Landslides, Sea Level rise, etc.





Comprehensive Coverage of Data

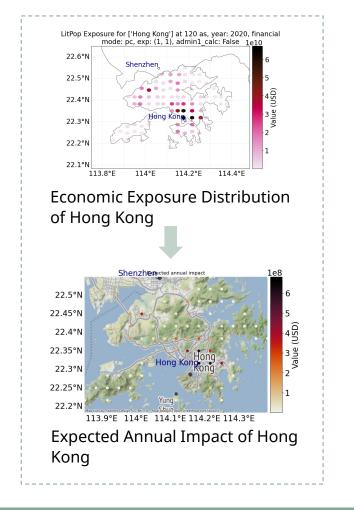
YoujiCRMS is a state-of-the-art climate risk model that integrates a wide array of **meteorological data**, **hazard data**, and **geo-economic data**. It not only incorporates extensive historical data, providing insights into past climate events and trends, but is also adaptable for use in a wide variety of future scenarios.



Worldwide Damage Ratio Curve

The damage ratio curve covers global locations and different scenarios.

Hong Kong as an example



Historical Tropical Cyclone Data of Florida

Nearly 200 years global historical hazard track data;

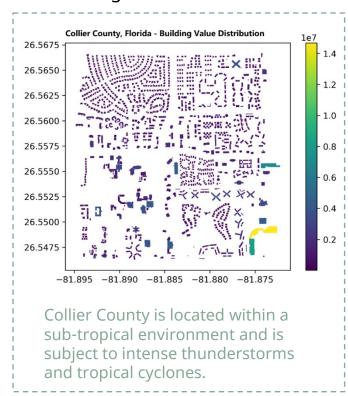
More than **9** synthetic trajectories simulated for each historical events;

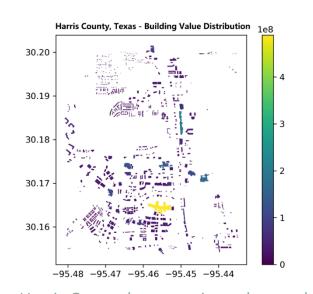
Monte Carlo simulations influence distribution.

Source: YoujiVest Climate Lab

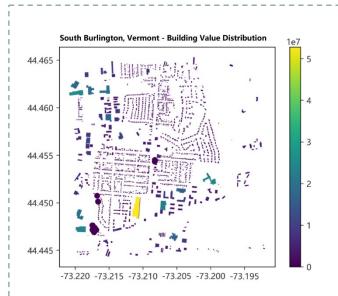
High-Resolution in Practice: County-Specific Analysis

YoujiVest's high-resolution model enables county-level analysis of construction distributions, as well as the values of such constructions. According to the color bar on the right side of the figure, higher positions (closer to the yellow) indicate higher values.





Harris County has experienced several significant flooding events, including Tropical Storm Harvey in 2017. It has high flood susceptibility.



South Burlington, Vermont, like many areas in the northeastern United States, can be susceptible to landslide.

Source: YoujiVest Climate Lab, OpenStreetMap, FRED Economic Data



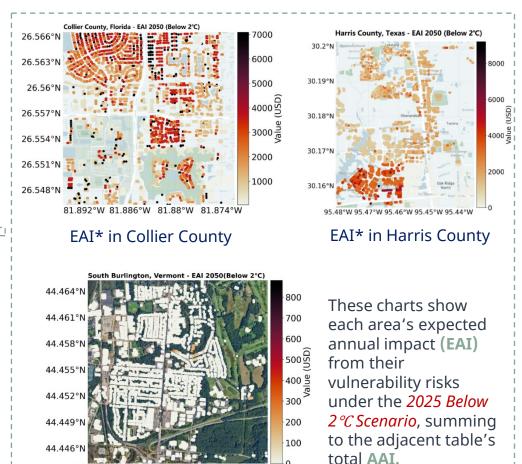
High-Resolution in Practice: Building Level Analysis

Total Annual Average Aggregated Impact Under NGFS Below 2°C Scenario and Current Policies

Site	Hazard	Forecast Year	NGFS Scenarios	AAI** (USD)
		2030	Below 2°C	5,756,872
		2030	Current Policies	6,195,710
Collier County,	Tropical	2050	Below 2°C	5,840,150
Florida	Cyclone	2050	Current Policies	6,726,096
		2080	Below 2°C	5,724,387
		2060	Current Policies	7,570,697
		2030	Below 2°C	20,623,873
		2030	Current Policies	20,618,012
Harris County,	Divor Flood	2050	Below 2°C	20,722,498
Texas	River Flood	2050	Current Policies	21,103,545
		2080	Below 2°C	20,585,117
		2060	Current Policies	22,142,107
		2030	Below 2°C	578,144
South Burlington, Vermont		2030	Current Policies	576,650
	Landelida	2050	Below 2°C	582,626
	Landslide	2030	Current Policies	605,035
VCITIOIIC		2080	Below 2°C	575,157
		2000	Current Policies	661,803

^{*}EAI: Expected Annual Impact

Source: YoujiVest Climate Lab,

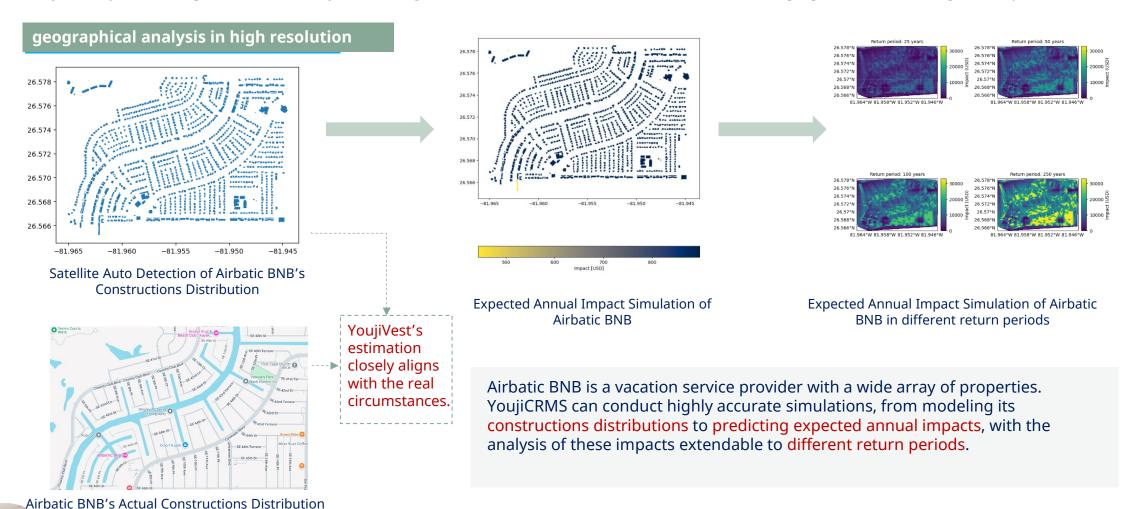


EAI* in South Burlington

^{**}AAI: Total Annual Average Aggregated Impact Value - the predicted annual loss for the entire location, calculated as the sum of EAI across all positions within the area. ***Percentage: The proportion of the AAI relative to the location's GDP in 2023.

High Resolution for Any Specific Location

YoujiCRMS provides high resolution analysis (the highest in the market: 5m x 5m) with satellite imaging and down-scaling techniques.



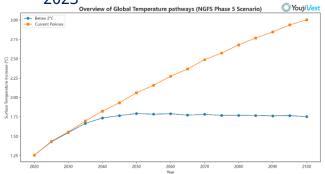
Source: YoujiVest Climate Lab

High-Resolution in Practice: State-Specific Analysis

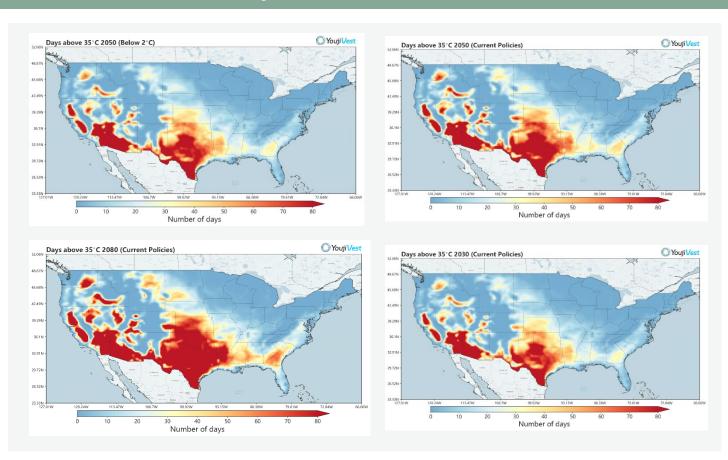
Number of Extreme Heat days in United States



2023



Projected Global Temperature Rise Under Two Scenarios by **NGFS**



Projected Extreme Heat Days Under different Scenarios by YoujiVest

Next-Gen Climate Risk Management: Bridging AI Forecasting with Multidimensional Risk Analytics

Industry demands actionable, data-driven solutions

YoujiCRMS bridges traditional and modern approaches

Vision for Climate Resilience



Core Features & Technological Breakthroughs

Hybrid Risk Modeling Framework

Transformer architecture in near-term weather forecasts.

Climate re-analysis model to simulate long-term scenarios.

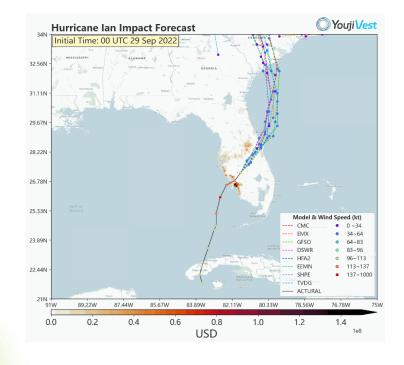
Hazard event database to back-test model results.

Global Data Integration

YoujiCRMS's global data hub employs advanced data integration algorithms to integrate diverse data sources including hazard records, geographics, satellite, IoT, and ground sensor data, seamlessly.

Multi-Sector Use Cases

Product customized to meet various use cases in insurance, banking, construction and property sectors.





Competitive Advantages

01

Speed & Efficiency

Offers faster forecasts compared to traditional models.

Achieve zero supercomputer dependency with desktop- compatible models.



02

Data Autonomy

Ensures end- to- end data autonomy without reliance on numerical weather prediction (NWP) models.

Maintain complete control over data

Maintain complete control over data sources and processing for enhanced accuracy.



03

Customization & Scalability

Provides API- driven customization for sector- specific needs.

Support large- scale deployments with the ability to handle 100k+ asset- level assessments simultaneously.





Application

YoujiVest Climate Risk Solution has been widely applied to leading financial institutions and corporates, across leading construction firms, mining companies, insurance institutions, and asset managements.

Including: catastrophe bond (CAT) analysis, catastrophe actuarial model analysis, engineering climate risk modelling, engineering disaster resilience measurement, and climate compliance report.







































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Application in Financial Institution

Case Studies and Innovating Products

Banking | Asset Management | Insurance

2024 SEC's Final Rule: Detailed Climate-related Information Disclosure

Context

On March 21, 2022, the SEC issued for public comment a proposal to amend its rules under the Securities Act of 1933 and the Securities Exchange Act of 1934 to require public companies (including KeyCorp) to provide detailed climate-related information in their registration statements and periodic reports.

In March 2024, the SEC published its final rules for the Enhancement and Standardization of Climate-Related Disclosures for Investors. The new rules follow the recommendations of the TCFD and will be gradually applicable starting in 2025.

Objective

Improve the consistency, comparability, and reliability of climate-related information for investors, based on the TCFD framework and the input of commenters.

Climate-related Risks Disclosure Items

- 1) The type of identified climate-related risk (whether physical or transition);
- The information needed to comprehend the nature and scope of the risk;
- A non-exhaustive list of disclosures to be included, as relevant (for example, the geographic location and characteristics of properties, processes, or operations affected by physical risk, the type of transition risk, and its impact on the registrant).

Note: The scope of disclosure encompasses any material climate-related risks that impact a registrant's business strategy, operational results, or financial condition. A material climate-related risk is defined as one for which there is a significant likelihood that a reasonable investor would deem it important when deciding whether to buy or sell securities, or how to vote. Additionally, a reasonable investor would perceive the omission of such disclosure as having notably changed the overall mix of information available.

FINAL RULE

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The Enhancement and Standardization of Climate-Related Disclosures for Investors

Public Comments

VIEW RECEIVED COMMENTS

Overview

The Securities and Exchange Commission ("Commission") is adopting amendments to its rules under the Securities Act of 1933 ("Securities Act") and Securities Exchange Act of 1934 ("Exchange Act") that will require registrants to provide certain climate-related information in their registration statements and annual reports. The final rules will require information about a registrant's climate-related risks that have materially impacted, or are reasonably likely to have a material impact on, its business strategy, results of operations, or financial condition. In addition, under the final rules, certain disclosures related to severe weather events and other natural conditions will be required a registrant's audited financial statements.

Source: SEC

Case 1. Banking Climate Risk Stress Testing

Mandatory for SDST banks or upon request by global regulators

Overview

 As compared to the pilot exercise, there are several major enhancements in 2023-2024 CRST in respect of climate scenarios, assumptions, assessment approaches and reporting requirements

Scenario Narratives & Specifications

- Sectoral impacts under transition
- Short-term scenario (2023-2027): combining climate risk drivers (more frequent occurrences of extreme climate events, accelerated transition to a lowemission economy) and Macroeconomic risk drivers (global economic downturn, HK in recession, slowdown in ML)
- Long-term scenario (2023-2050):include below 2 °C, delayed transition, current policies

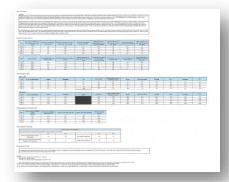
Assessment Requitements

- Full balance sheet covering both on and off balance sheet
- Assessment approaches, include quantitative analyses, qualitative analysis, balance sheet treatment, physical risk assessment, transition risk assessment, key assessment metrics and projection interval, model risk assessment

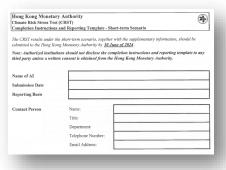
Submission of Results

- Results reporting
- Submission timeline (2023 and 2024 results for short-term scenario should be submitted by 20231231 and 20240630 respectively; results for longterm scenarios should be submitted by 20240630)



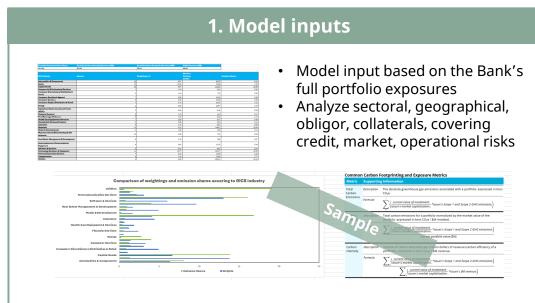








Case 1. Climate Risk Stress Testing Tool



Model parameters based on HKMA CRST scenario and assumptions, and also other science-based climate data and projection eg NGFS Model also based on historical market and corporates ESG and financials data as parameters Sample Sa

Model approach:

Model Input: Full bank's portfolio exposures & operations

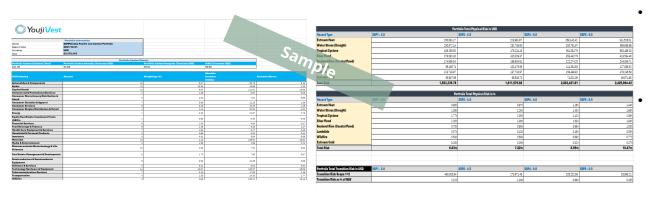
Model Parameters: CRST scenarios & assumptions

Model Output: Capital impact and risk assessment to the Bank

Key Feature:

- 1. Scenario-based Analysis
- 2. Risk Aggregation
- 3. Time-series Projection
- 4. User-friendly Interface
- 5. Compatibility and Integration

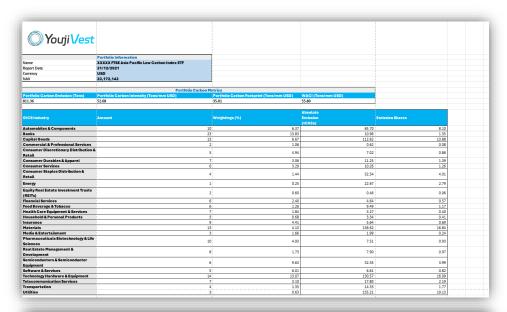
3. Model outputs

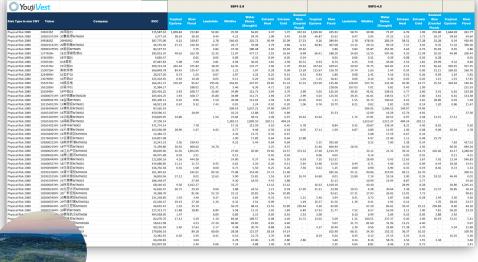


- Model output include climate transition and physical risk impact to the Bank's exposures, including sectoral and obligor level and operational loss assessment
 - Model will assess the climate risk impact to the Bank's various risk (credit, market, operational risk RWA), expected credit losses, other regulatory ratios if needed, profitability (earning, provision, loss), impact to fair value of assets, and operational loss.



Case 1. Fund Level Analysis: Asset Management





For each equity/bond, YoujiVest CRMS calculates all the underlying subsidiaries risk exposure x revenue% of parent company.

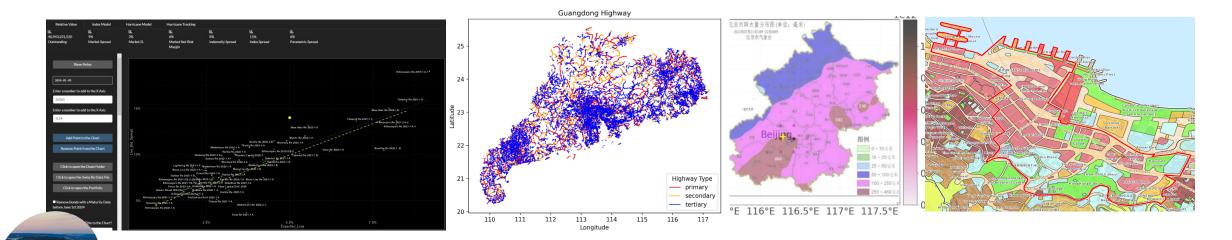
										Water			Sealevel					Water			Sealevel
Ticker	Company Name	Company Address	EVIC	Reference Year	Veight%	Tropical Cyclone	River Flood	andslide 1		Stress (Drought)	Extream Heat	Extream Cold		Tropical Cyclone	River Flood	Landslide	Wildfire	Stress (Drought)	Extream Heat	Extream Cold	Rise (Coastal Flood)
7253SH	广东能源财产保险自保有限公司	广州市	143247.34	2080	0.68	82. 95	212.06	2.78	0.35	1.63	0.13	0	2. 28	116.62	245. 38	3.12	0.69	1.96	0.13	0	2.61
27253SH	广东韶关粤电力新能源有限公司	韶关市	143247.34	2080	0.08	0.08	0.53	5. 65	3.66	3. 36	0. 25	0.04	0	0.12	0.61	6. 22	4. 39	4.2	0.49	0.03	0
7253SH	广东粤电启明能源有限公司	深圳市	143247.34	2080	0.09	45. 29	0	2.03	0	0	0	0	10.67	56. 78	0	2. 26	0	0	0	0	12. 19
7253SH	广东粤电技术工程管理有限公司	东莞市	143247.34	2080	0.05	12. 15	18.85	0.05	0.05	0	0	0	0.48	15.77	21.79	0.05	0.05	0	0	0	0.55
7253SH	广东能源茂名热电厂有限公司	茂名市	143247.34	2080	1.63	501.07	0	12.53	0	102.8	0.62	0	0	594.61	0	14. 2	0	128.7	1.23	0	0
7253SH	广东粤电大南海智慧能源有限公司	揭阳市	143247. 34	2080	0.41	63.77	0	0.83	2.49	19. 13	0.23	0	0.2	79.56	0	0.83	2.91	23.82	0.46	0	0.39
7253SH	广东红海湾发电有限公司	汕尾市	143247.34	2080	5, 27	2559.34	0	231. 93	45.85	593.02	0.99	0	215. 41	3133.77	0	256. 2	53.94	742.54	1.99	0	245.82
7253SH	广东粤电大亚湾综合能源有限公司	惠州市	143247. 34	2080	0.55	138, 22	115.84	11.75	17.91	23.4	0.1	0	1.84	177. 12	133.75	13. 15	21.54	29. 45	0.31	0	2.1
7253SH	广东粤华发电有限责任公司	广州市	143247.34	2080	1.28	157. 14	401.74	5. 26	0.66	3.09	0.24	0	4.33	220. 92	464.86	5. 92	1.32	3. 71	0.24	0	4.94
7253SH	湛江电力有限公司	湛江市	143247.34	2080	5. 19	2094. 59	18.58	2.65	0	471.49	13.71	0	54.88	2500.77	21.24	2.65	0	588. 74	27.42	0	62.37
27253SH	深圳市广前电力有限公司	深圳市	143247.34	2080	3. 21	1612.58	0	72.33	0	0	0	0	380	2021.88	0	80. 55	0	0	0	0	434.06
7253SH	广东粤电大埔发电有限公司	梅州市	143247.34	2080	4. 53	136.69	1839. 49	53. 29	101.94	1395.49	32.47	0.85	0	178.39	2129.09	57. 92	122.79	1748. 18	64.09	0.85	0
7253SH	湛江中粤能源有限公司	湖江市	143247.34	2080	2. 29	923. 01	8. 19	1.17	0	207.77	6.04	0	24. 18	1102	9.36	1.17	0	259. 44	12.08	0	27. 48
7253SH	湘潭湘电昌山风力发电有限公司	湘潭市	143247.34	2080	0.21	0.22	0.22	1.2	0.98	0	1.28	0.36	0	0.33	0.22	1.31	1.2	0	2.57	0.24	0
7253SH	金昌市沐洪新能源有限公司	金昌市	143247.34	2080	0.29	0	1.61	20. 35	1.02	37. 14	0.16	1.24	0	0	1.9	22. 54	1.32	46. 49	0.27	0.86	0
7253SH	金昌市洁源沐津新能源有限公司	金昌市	143247.34	2080	0.29	0	1.61	20. 35	1.02	37.14	0.16	1.24	0	0	1.9	22.54	1.32	46. 49	0.27	0.86	0
7253SH	广东粤电航运有限公司	深圳市	143247.34	2080	0.66	330, 31	0	14.82	0	0	0	0	77.84	414. 15	0	16.5	0	0	0	0	88.91
7253SH	广东粤电虎门发电有限公司	东莞市	143247.34	2080	0.01	1.94	3. 01	0.01	0.01	0	0	0	0.08	2, 52	3, 48	0.01	0.01	0	0	0	0.09
7253SH	广东粤电电力销售有限公司	广州市	143247, 34	2080	0, 55	66, 78	170, 72	2, 24	0, 28	1, 31	0.1	0	1.84	93, 88	197, 54	2, 51	0.56	1, 58	0.1	0	2.1
7253SH	广东粤电云河发电有限公司	云浮市	143247.34	2080	2.53	240.99	432.75	66.08	27. 21	107.14	3, 35	0	0	327.8	501.42	73. 85	32.39	133. 93	6.69	0	0
7253SH	贵州粤黔电力有限责任公司	六盘水市	143247.34	2080	0, 55	0	0	14, 37	1, 69	74, 94	0	1, 35	0	0	0	15, 78	1.97	93, 74	0	0.94	0
27253SH	广东能源集团财务有限公司	广州市	143247.34	2080	2.54	310.73	794. 38	10.4	1.3	6.11	0.48	0	8. 55	436.85	919. 2	11.7	2.6	7. 33	0.48	0	9.77
7253SH	临沧粤电能源有限公司	临沧市	143247.34	2080	0, 67	0	12.63	36. 87	2.73	84. 36	0	0	0	0	14, 68	40.62	3. 41	105.86	0	0	0
7253SH	广东粤电白花综合能源有限公司	惠州市	143247.34	2080	0.01	1.8	1. 51	0.15	0. 23	0.3	0	0	0.02	2.31	1.74	0.17	0. 28	0.38	0	0	0.03
7253SH	广东粤电滨海湾能源有限公司	东莞市	143247.34	2080	1, 71	437, 33	678, 73	1, 75	1, 75	0	0	0	17, 26	567, 65	784, 57	1, 75	1, 75	0	0	0	19, 73
7253SH	粤电莎车综合能源有限公司	喀什地区	143247.34	2080	2, 86	0	17. 58	0	0	448, 85	17, 29	11. 35	0	0	20, 51		0	561, 75	33, 51	7, 57	0
7253SH	广东能源融资租赁有限公司	广州市	143247, 34	2080	1, 28	155, 99	398, 77	5, 22	0.65	3, 07	0. 24	0	4, 29	219, 29	461, 43	5, 87	1. 31	3, 68	0.24	0	4. 91
7253SH	广东粤电茂名天然气热电有限公司	茂名市	143247, 34	2080	0. 27	84, 07	0	2, 1	0.00	17, 25	0.1	0	0	99, 77	0	2, 38	0	21, 59	0, 21	0	0
7253SH	广东粤电毕节新能源有限公司	毕节市	143247.34	2080	0. 03	0	0.14	2, 55	0.14	3. 21	0.03	0.06	0	0	0.16	2, 82	0.18	4. 02	0.06	0.05	0
7253SH	广东粤电惠新热电有限公司	惠州市	143247, 34	2080	0, 25	63	52, 79	5, 36	8, 16	10, 67	0, 05	0.00	0, 84	80, 72	60, 96	5, 99	9, 82	13, 42	0.14	0.00	0.96
7253SH	广东粤电惠博新能源有限公司	惠州市	143247.34	2080	0.04	9. 3	7. 79	0.79	1.2	1.57	0.01	0	0.12	11. 91	9	0.88	1. 45	1.98	0.02	0	0.14
7253SH	粤电金秀综合能源有限公司	来宾市	143247.34	2080	0.01	0, 25	0, 04	0, 12	0, 05	0,66	0, 01	0	0, 17	0, 33	0, 04	0, 13	0.06	0, 83	0, 02	0	0.2
7253SH	广东省沙角(C厂)发电有限公司	广州市	143247.34	2080	3. 7	452, 67	1157. 24	15. 15	1.89	8.9	0.7	0	12, 46	636. 39	1339. 07	17.05	3, 79	10.68	0.7	0	14. 24
7253SH	广东粤电永安天然气热电有限公司	肇庆市	143247.34	2080	0, 85	60. 79	44, 17	5, 25	9, 62	25, 89	0.48	0	0	89, 21	51, 17	5, 69	11. 37	32, 47	0.97	0	0
7253SH	广东粤电靖海发电有限公司	据阳市	143247, 34	2080	5, 82	913, 86	0	11. 91	35, 72	274, 13	3, 29	0	2.8	1140, 09	0	11. 91	41.67	341, 27	6, 59	0	5, 59
7253SH	深圳市花果泉电业服务有限公司	深圳市	143247, 34	2080	0.12	59, 21	0	2, 66	0	0	0	0	13, 95	74, 23	0	2, 96	0	0	0	0	15. 94
7253SH	华能汕头风力发电有限公司	油头市	143247.34	2080	0.14	18.87	0	0	1. 24	0	0.05	0	1.44	23, 26	0	0	1.54	0	0.08	0	1.65
7253SH	广东粤电花都天然气热电有限公司	广州市	143247.34	2080	0.44	54. 16	138, 47	1.81	0. 23	1.06	0.08	0	1.49	76. 14	160. 22	2.04	0.45	1.28	0.08	0	1.7
7253SH	广东粤电博贺能源有限公司	茂名市	143247, 34	2080	8, 28	2542, 77	0	63, 57	0.00	521.7	3, 13	0	0	3017, 42	0	72.05	0	653, 12	6, 25	0	0
7253SH	南方海上风电联合开发有限公司	珠海市	143247.34	2080	0.46	201.89	0	72. 51	0	0	0	0	73. 26	264. 2	0	80. 09	0	0	0	0	83.5
7253SH	湛江粤新分布式能源技术有限公司	港江市	143247.34	2080	0.02	6, 56	0.06	0.01	0	1, 48	0, 04	0	0, 17	7, 83	0.07	0.01	0	1.84	0, 09	0	0, 2
7253SH	梅州兴粤新能源有限公司	梅州市	143247.34	2080	0.02	0.72	9. 62	0. 28	0.53	7.3	0.17	0	0	0, 93	11.14	0.3	0.64	9. 15	0.34	0	0
7253SH	莱西市鑫广曜新能源科技有限公司	青岛市	143247.34	2080	0.08	0.08	0	0	0.28	0	0	0.07	12, 52	0. 16	0	0	0.32	0	0. 01	0.04	14, 28
7253SH	云南能投威信能源有限公司	照通市	143247, 34	2080	0. 2	0.00	3, 15	3.04	2, 62	16, 45	0.08	0. 19	0	0.10	3, 67	3, 35	3, 15	20, 59	0.19	0.15	
7253SH	中航中新风力发电有限公司	广州市	143247. 34	2080	0.41	50, 61	129, 39	1. 69	0.21	10.40	0.08	0.10	1. 39	71, 16	149, 72	1. 91	0.42	1. 19	0.08	0.10	1.59
7253SH	广东惠州平海发电厂有限公司	惠州市	143247.34	2080	1.71	432, 27	362, 26	36, 75	56	73. 18	0, 32	0	5, 76	553. 9	418, 27	41. 13	67. 38	92, 09	0.97	0	6, 58
7253SH	云浮罗定粤电新能源有限公司	云浮市	143247.34	2080	0	0.42	0.75	0.11	0.05	0. 19	0.01	0	0.10	0.57	0.87	0.13	0.06	0. 23	0.01	0	0.00
7253SH	九州新能源(肇庆)有限公司	肇庆市	143247. 34	2080	0.09	6. 59	4. 79	0. 57	1.04	2.8	0.01	0	0	9, 66	5. 54	0. 62	1, 23	3, 52	0.1	0	0
7253SH	广东省风力发电有限公司	广州市	143247. 34	2080	18. 29	2236. 92	5718.64	74. 88	9. 36	43. 98	3. 45	0	61.57	3144. 79	6617. 15	84. 24	18. 72	52.77	3. 45	0	70.36
7253SH	図本舒克粤电瀚海新能源有限公司	自治区直轄县级行政区划	143247. 34	2080	0, 77	0	16, 14	4. 72	6, 3	37. 36	1. 6	1, 45	01.01	0144.19	18.5	5, 51	7, 48	46, 61	3, 19	1, 02	
7253SH	广东省电力工业燃料有限公司	广州市	143247. 34	2080	2. 05	251, 31	642, 47	8. 41	1.05	4, 94	0, 39	1. 40	6. 92	353. 3	743, 41	9, 46	2.1	5, 93	0.39	1.02	7.9
7253SH		TECTAL TALES	143247. 34	2080	0.11	35, 53	40, 51	0. 41	1. 05	3, 5	0. 39	0	0.92	46, 15	46, 86	0, 82	2. 08	4, 37	0. 39	0	1.9
7253SH 7253SH	台山市东洞中能新能源有限公司	無州市	143247. 34	2080	2, 86	723, 25	40. 51 606. 13	61, 49	93.7	122, 45	0.02	0	9, 63	46. 15 926, 76	46.86 699.83	68, 81	2. 08 112. 73	4. 37 154. 09	1.62	0	11.01
	广东惠州天然气发电有限公司 国体験中ム山公中在四人司											0	9. 63							0	11.01
7253SH	国能粤电台山发电有限公司	注目市 と25日で水井田 80.512年であり	143247. 34	2080	4. 51	1499. 04	1709. 22	32. 34	73. 91	147. 59	0.85	0	0	1947. 13	1977. 16	34. 65	87.77	184. 49	1.7	0	0

Case 2. CAT Bond Analysis: Assets Exposure Assessment

YoujiVest CRMS Provides analysis on

- Distance to the coast
- Construction quality
- Age of building
- Sponsors underwriting track record
- Loss reserving
- Business mix and geographical footprint
- Absolute risk tolerance assessment





Case 2. Florida Hurricane CAT Bond Analysis

SUBJECT TO COMPLETION, DATED MARCH 11

CONFIDENTIAL

OFFERING CIRCULAR SUPPLEMENT NO TO THE OFFERING CIRCULAR

Hestia Re Ltd.

\$[●] Series 2022-1 Class A Principal At-Risk Variable Rate Notes

Hestia Re Ltd. (the "Issuer") is hereby offering \$|•| Series 2022-1 Class Notes due April[•], 2025 (the "Series 2022-1 Notes"), which will be exposed to the j Covered Area during the Risk Period, on a per occurrence basis as more fully describ

This Offering Circular Supplement should only be read together with, the at "Offering Circular"). All capitalized terms used but not otherwise defined in this the respective meanings ascribed to such terms in the Offering Circular. If there described in this Offering Circular Supplement and the Offering Circular, the terms o will control. The Offering Circular, taken together with this Offering Circular Suppl this "Offering Document."

Investing in the Series 2022-1 Notes is speculative and involves a high d beginning on page 14 of the Offering Circular and "Additional Risk Factors" begin Circular Supplement for a discussion of certain factors to be considered in connect 2022-1 Notes.

The Series 2022-1 Notes are with limited recourse to certain assets of the Ceding Insurer or its subsidiaries or affiliates or any of its respective assets.

THE SERIES 2022-1 NOTES HAVE NOT BEEN AND WILL NOT E
ENTITED STATES SECURITIES ACT OR ANY US. STATE OR FOREON:
BEING OFFERED AND SOLD IN BOOK-ENTRY FORM ONLY TO INVESTOR
BEING OFFERED AND SOLD IN BOOK-ENTRY FORM ONLY TO INVESTOR
BY STATEMENT OF THE STATEMENT OF AND PURCHASING IN, A)
2022-1 NOTES IN, A PERMITTED US. JURISDICTION OR A PERMITTED IN
SERIES 2022-1 NOTES ARE NOT BEING OFFERED TO THE PUBL
PROSPECTIVE PURCHASERS ARE HERBEY NOTIFED THAT THE ST
NOTES MAY BE RELYING ON THE EXEMPTION FROM THE PROVISI
SECURITIES ACT PROVIDED BY RILE 144A. THE SERIES 2022-1 NOTI
IN THE OFFERING CIRCULAR. EACH PURCHASER OF THE SERIES 2
PURCHASE, WILL BE DEFAILD TO HAVE MADE CERTA
REPRESENTATIONS AND AGREEMENTS AS SET FORTH UNDER
REPRESENTATIONS AND AGREEMENTS AS SET FORTH UNDER

The Series 2022-1 Notes will be offered by Swiss Re Capital Markets (
Strategies LLC (Incown by its marketing name TigerRisk Capital Markets & Advisor
2022-1 Notes (each, an "initial Purchaser" and collectively, the "Initial Purchaser
receipt and acceptance by each Initial Purchaser and subject to such Initial Purchaser
or in part. The Initial Purchasers expect to deliver the Series 2022-1 Notes in book
The Depository Trust Company ("DTC") against paymentHereforin immediately av

Swiss Re Capital Markets Joint Structuring Agent and Joint Bookrunner TigerRisk Capital Ma Joint Structurin

Offering Circular Supplement No. 1 dated [•], 202

not apply to reinsured Policies containing a standard war exclusion clause.

- (iv) All liability of the Ceding Insurer arising by contract, operation of law, or otherwise, from its participation or membership, whether voluntary or involuntary, in any Insolvency Fund. "Insolvency Fund" includes any guaganty fund, insolvency fund, plan, pool, association, fund, or other arrangement, howsoever denominated, established, or governed, that provides for any assessment of or payment or as sumption by the Ceding Insurer of part or all of any claim, debt, charge, fee, or other obligation of an insurer, or its successors or assigns, which has been declared by any competent authority to be insolvent, or which is otherwise deemed unable to meet any claim, debt, charge, fee, or other obligation in whole or in part.
- (v) Loss or liability excluded by the "Pools, Associations, and Syndicates Exclusion Clause (Catastrophe)" attached to and forming part of the Reinsurance Agreement. However, in no event shall any assessment or similar demand for payment related to the Floridad Humicane Catastrophe Fundor Citizens Property Insurance Corporation be covered under the Reinsurance Agreement.
- (vi) Loss or liability excluded by the "Nuclear Incident Exclusion Clause - Physical Damage - Reinsurance - U.S.A" attached to and forming part of the Reinsurance Agreement.
- (vii) Loss or liability excluded by the "Terrorism Exclusion" attached to and forming part of the Reinsurance Agreement.
- (viii) Losses in the respect of overhead transmission and distribution lines and their supporting structures other than those on or within 150 meters (or 500 feet) of the insured premises. It is understood and agreed that public utilities extension and or suppliers extension and/or contingent business interruption coverages are not subject to this exclusion, provided that these are not part of a transmitters' or distributors' Police.
- (ix) Seepage and pollution, defined as any loss or damage or cost or expenses arising from seepage and/or pollution and/or contamination, other than contamination from smoke. Nevertheless, this exclusion does not preclude payment of the cost of the removal of debris of property damage by a loss otherwise covered under the Reinsuance Agreement, subject always to a limit of 25.0% of the Ceding Insurer's property loss under the Policy.
- (x) All liability arising out of mold, spores and/or fungus but this exclusion shall not apply to those losses which follow as a direct result of a loss caused by a peril otherwise covered under the Reinsurance Agreement.

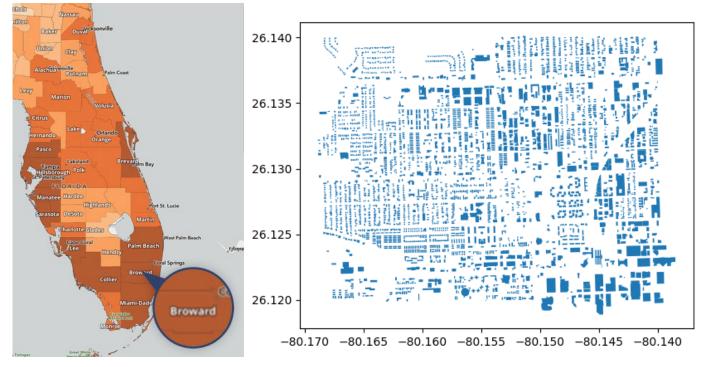
S-22

Expert Risk from traditional Actuarial Model

- Other Risks Relating to Permitted Investments
- While Permitted Investments Are Held in Cash, the Investment Yield Will Be Zero and the Applicable Notes Will Be Exposed to the Risks of Deposits in The Bank of New York Mellon, Including the Risk of Insolvency or Receivership
- o The Reinsurance Trustee May Be Unable to Liquidate Investments in a Timely Manner
- o Future Downgrades of Permitted Investments May Not Result in Their Replacement
- Effective Subordination of the Applicable Notes upon Events of Default; Limitations on Enforcement and Security Interest
- The Reinsurance Trust Agreement Does Not Prevent the Ceding Company from Withdrawing Assets from the Reinsurance Trust Account
- Enforcement of Security Interest Granted to the Indenture Trustee for the Benefit of the Noteholders
- Risks Related to the AIR Expert Risk Analysis Reports
- The Data and Methodology of AIR Described In the AIR Expert Risk Analysis Report Are Provided "As Is" Without Warranty or Any Guaranty of Any Kind to the Noteholders
- The AIR Expert Risk Analysis Reports Do Not Address All Types of Loss Occurrences or Types of Covered Losses Resulting Therefrom
- The Chronology of Loss Occurrences Used in the Risk Analysis Report May Not be Representative of the Chronology the Ceding Company Selects Pursuant to the Reinsurance Agreement
- o The Modeled FHCF Reimbursement Could Differ Materially from the FHCF Reimbursement
- The Escrow Models May Not Reflect the Most Current Models of AIR
- o There Are No Representations with Respect to the AIR Expert Risk Analysis Reports
- Data Used in the Risk Analysis May Be Incomplete or May Not Be Representative of the Subject Business
- o AIR's Relationship with the Issuer, the Ceding Company and the Initial Purchasers
- o AIR Has No Direct Contractual Liability to Noteholders
- o AIR Has No Obligation to Update the AIR Expert Risk Analysis Reports
- Use of Different Models
- Additional Regulatory Risks
- Dodd-Frank's Volcker Rule Could Restrict the Ability of Certain Investors to Invest in the Applicable Notes and Could Have an Adverse Effect on the Marketability and Liquidity of the Applicable Notes
- Implementation of and/or Changes to the Basel II Risk-Weighted Asset Framework May Result in Changes to the Risk-Weighting of the Applicable Notes
- Legal and Regulatory Provisions may Limit or Restrict Certain Investors



Florida Hurricane CAT Bond Analysis





Broward County

YoujiVest Climate Scan

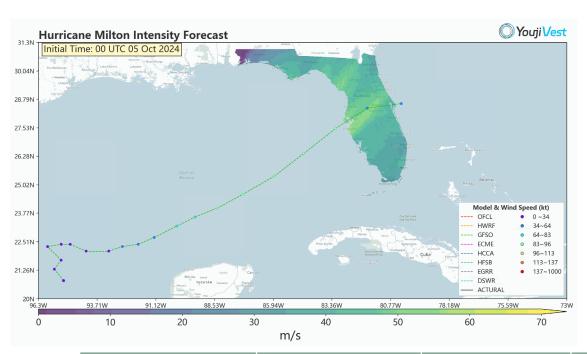
Google Satellite Map

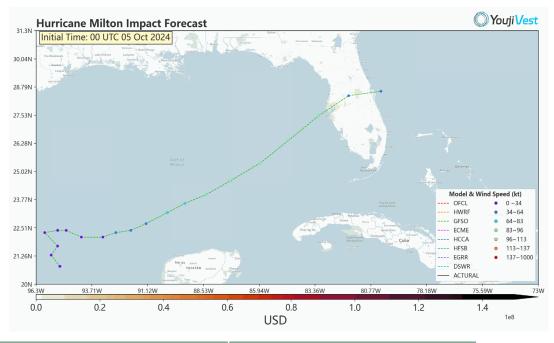
Building Distribution Analysis Broward County, Florida YoujiVest Climate Lab



Hurricane Milton

YoujiVest CRMS generates hurricane track and potential loss projections.





GDP(USD Millions)	AAI(USD Millions)	Percentage	AVG Wind Speed(m/s)	Max Wind Speed(m/s)			
1,350,000	22,300	1.65%	24.5	80.4			

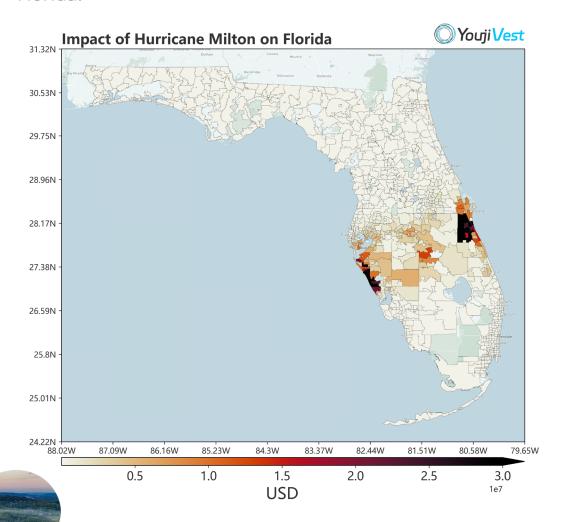
AAI(USD): Total Annual Average Aggregated Impact Value.

Percentage: Percentage of AAI to annual GDP.



Impact of Hurricane Milton on Florida

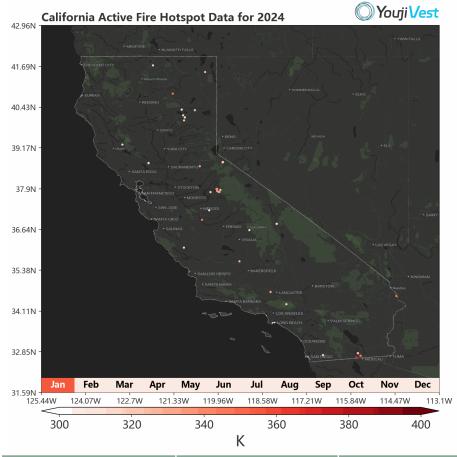
Hurricane Milton has resulted in unexpectedly high damage to counties in central Florida.

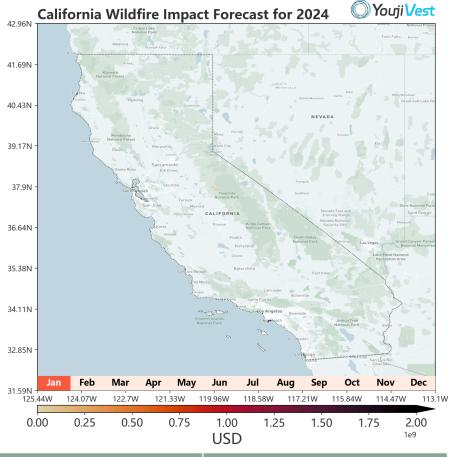


Analysis Scenario	Aggregate Loss (USD Millions)	Percentage				
2024 (All Hurricane)	2,269.48	0.695%				
Milton (2024)	2,185.96	0.669%				
Historical Average	1,408.32	0.431%				
2030 SSP1-2.6	1,537.16	0.471%				
2030 SSP5-8.5	1,616.18	0.495%				
2050 SSP1-2.6	1,562.81	0.478%				
2050 SSP5-8.5	1,918.85	0.587%				

Wildfire in California (2024)

Historical wildfire spots and potential loss on YoujiCRMS.



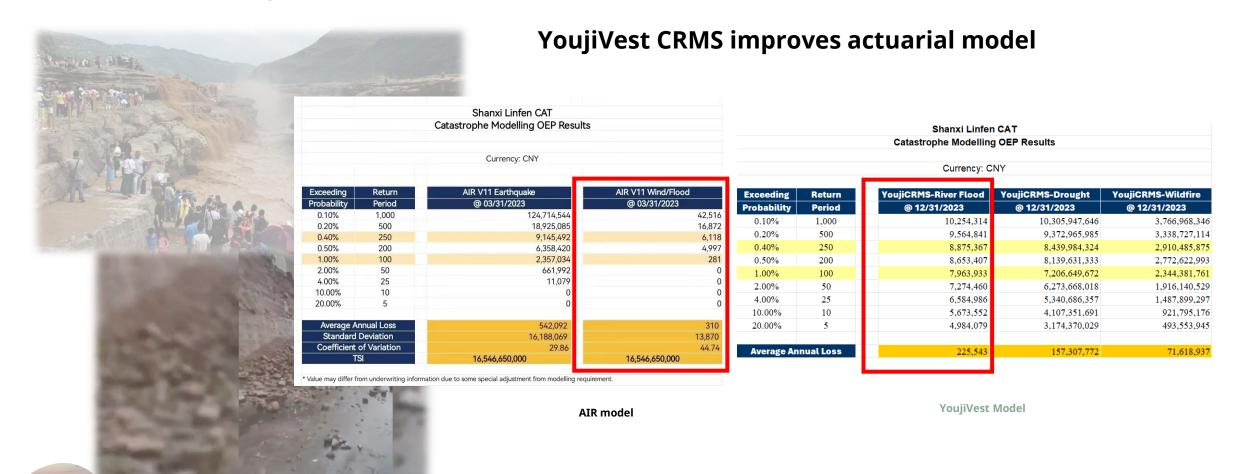


GDP(USD Millions)	AAI(USD Millions)	Percentage	Events of Wildfire	Maximum brightness of the wildfire
4,172,890	40,883	0.98%	136	509.5



Case 3. Catastrophe Modelling Comparison: Insurance

The 2021 Linfen City, Shanxi Province severe flood event



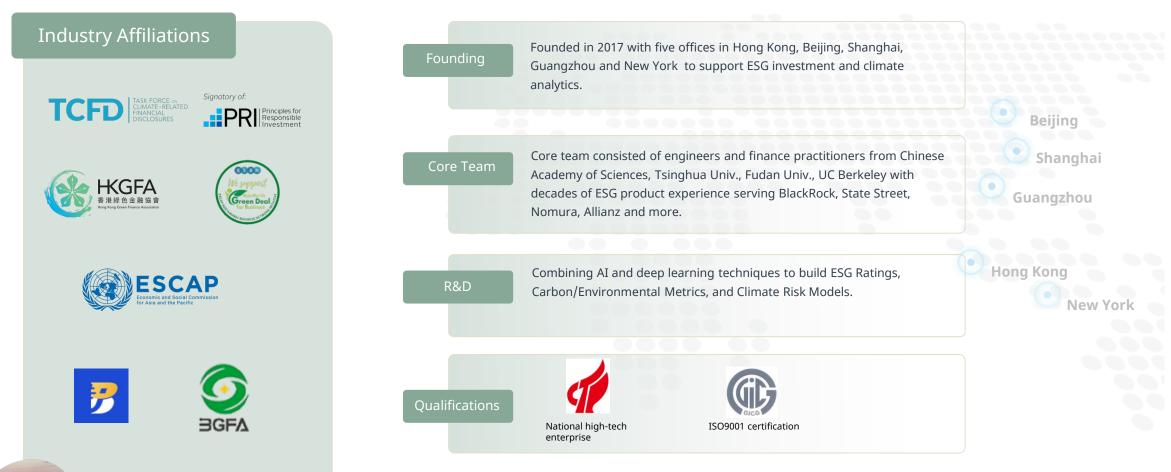


AAIL FOUNDATION



About Us

YoujiVest transforms sustainability challenges into market alpha by combining **cutting-edge AI**, **quantitative finance**, and **climate modeling expertise** to empower asset managers, banks, insurers, and corporations to navigate climate risks, meet regulatory requirements, and capture sustainable investment opportunities.

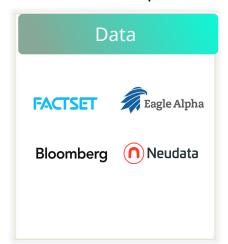


YoujiVest Partnerships

YoujiVest has established strategic partnerships to deliver comprehensive sustainable and climate finance solutions, including data analytics, fund product design, investment framework development, and more.













Research Collaboration

Climate Related Disasters and The Performance of Chinese-Listed Companies[†]

Guojun He1, Shuo Li2

We systematically examine the impacts of climate-related natural disasters (extreme temperatures, floods, typhoons, and droughts) on the performances of Chinese listed companies. We show that it is important to measure climate risk exposures separately for their headquarters and the subsidiaries, as only the subsidiaries' exposures have significant negative impacts on the listed companies' performances. Heterogeneity analyses reveal that the agriculture sector, service sector, and small and young firms are particularly vulnerable to extreme weather conditions. Further, the negative impacts of climate risks have decreased substantially in the past two decades, suggesting firms could adapt to climate risks over time. Finally, the stock market does not seem to price in the negative impacts of physical climate risks.

Keywords: Physical climate risk, company performance, climate change, adaptation IEL Codes: L51, O44, O52, O58, R38

- 1 Faculty of Business and Economics, University of Hong Kong, Hong Kong SAR, China; Email: gihe@hku.hk.
- 2 Faculty of Business and Economics, University of Hong Kong, Hong Kong SAR, China; Email: shuoli@bku.hk
- † Authors are ranked alphabetically and contributed equally to the manuscript. The authors thank seminar and conference participants at HKU, HKU lockey Club Inaugural ESG Forum China Climate Impact Conference for valuable comments. The authors also appreciate YoujiVest's data support in the project.



Source: Guosen Securities

Hong Kong Economic Policy Green Paper 2025 **Transform Climate Risks into Development Opportunities** - Implications for Hong Kong's Economic Development in an Era of Climate Change Guojun He Qidan Wang Vivi Hu Cheng Bi 1 Introduction According to the World Economic Forum's Global Risks Report (2024), three key climate issues have been identified as critical challenges facing humanity: extreme weather events, critical change to earth systems, and biodiversity loss and ecosystem collapse. The current warming of 1.44°C, compared to pre-industrial times, is already causing disruptive global economic impacts (NASA, 2023) As a coastal city with low-lying terrain. Hong Kong is frequently affected by extreme weather events and has experienced multiple climate disasters in the past decades. Two climate risks are particularly concerning: the occurrence of severe typhoons and rising sea levels. On the one hand, strong tropical cyclones bring heavy rainfall, strong winds, storm surges, and flooding, often disrupting ed production and negatively affecting vulnerable areas and people. On the other hand, most of the particularly susceptible to the damages caused by sea level rises. In the following chapter, we first summarize the major climate risks Hong Kong has been exposed to with an emphasis on typhoons and sea level rise. Taking "Saola," a recent typhoon, as an example, we sea level rises would affect public housing and conduct scenario analysis on the potential eco losses under different climate pathways. Finally, we provide policy recommendations for adaptive 2 Overview of Climate Risks in Hong Kong Hong Kong has been warming up in the last century. Analysis from the Hong Kong Observatory (HKC

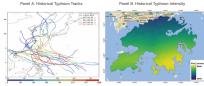
That number reached 0.30°C per decade from 1994 to 2023. Consistent with this trend, the annual average number of hot nights from 2001 to 2023 has increased by 67.18%, while the number of cold days has decreased by 18.19%, relative to 1991-2000 averages. The sea level is also steadily rising, with a growth rate in mean sea level of 31 mm per decade at Victoria Harbor from 1954 to 2023.

Meanwhile, Hong Kong has experienced more typhoons and heavy rainfall in the last two decades. These weather events, including storm surges, strong winds and coastal flooding, have caused significant damages.

2.1 Typhoons: The Most Frequent Climate Disaster in Hong Kong

With its back to the northwest Pacific Ocean, Hong Kong is bordered by a range of east-west mountains to the north and a vast ocean to the south, making it highly susceptible to typhoons. The city's temperature and humidity provide ample moisture for tropical cyclones, creating ideal conditions for trubnoon formation.

Figure 1. Historical typhoon tracks and intensity from 2014 to 202:



Votes. This Egain throat the subject of typicous affecting from (story with two parels.) Parel A (1,04) hours the statistical sepscentation of phytoxins in the northwest Pacific region from (2014 to 2023. Typicous, categorises by institute special to or exceeding Category 3 hyphorus, which is significant for Hong Kong. The depicted line segments represent phytonic appeals to the productions, with a color gradeties from parels be real industrial presentage specim intensity. The maximum intensity veceroids are supported to the production of the pro

According to the Hong Kong Observatory's definition, a hot night is a night with a minimum temperature of 28°C or above,

___ Transform Climate Risks into Development Opportunities

Hong Kong Economic Policy Green Paper 2025



Climate Related Disasters and The performance of Chinese-Listed Companies



Recognition: 2025 Hong Kong Green Fintech Map

ESG / Climate Risk Modelling & Assessment





Recognition: 2025 Global Resilience Technology Competition



After three competitive rounds and over 120 tech innovators from 17 countries, YoujiVest has taken 2nd runner-up at the global finals of the 2025 **Prudence Foundation** SAFE STEPS D-Tech Awards.

Representing China's innovation frontier, Youji Climate Risk Modelling System (CRMS) was recognized for pushing the boundaries of precision in earlywarning systems for extreme weather and climate disasters.

Products and Client Segments

ESG Risk Scores (CERS)

Environmental
Pollutant Discharge
(CEPD)

Carbon Emission Clim Metrics (CCEM) Soluti

Climate Risk Model Solutions (YoujiCRMS)

ESG Disclosure / Enhancement

Index Solutions

- Quantify overall ESG and 25 sub-issue risks through "sentiment" and "event" analysis
- Outside-in, negative scoring methodology to minimize "greenwashing" risks
- Over 10K+ data sources, including mainstream news, annual/CSR reports, NGOs, government agencies, social media and more

 Quantify 600+ discharged pollutants

- Data sourced directly from municipal and provincial sources
- A unique, uncorrelated source of "Environmental" alpha
- Urban city air pollution level real-time monitor, updated hourly

 Compile, normalize and quantify carbon emissions, carbon intensity and footprints

- Data sourced from public, primary sources encompassing Scope 1, 2, 3 GHG emissions
- Carbon emissions estimated for undisclosed companies based on proprietary models

 Global Climate Hazards Coverage with high resolution (5m x 5m)

- Covering all RCP-SSP scenario analysis pathways
- Meet the TCFD and various regulatory needs of listed companies and investors
- Quantitative analysis of physical risk and transition risk

Analytics

 Short term / Long term Loss projection

- ESG/ Corporate Sustainability Report preparation
- ESG report Assurance
- TCFD disclosure service
- PRI membership and signatory
- ESG Training
- MSCI Rating Improvement Services
- EcoVadis Reporting Services
- CDP Reporting Services

- Develop custom indexes that are investable, and widely relevant
- Experience fast and cutting-edge index research and development with an ever-growing collection of full suite of ESG and climate data sets.

Data

Consulting

Indexing

Our clients span financial institutions, academic institutions, and corporates, with tailored solutions for each:

- Financial institutions: YoujiVest's data and climate modeling solutions are widely adopted by leading asset managers, hedge funds, insurers, banks, and brokers for ESG investing, climate stress testing, quantitative strategies, risk management, and actuarial modeling.
- Academic institutions: Our comprehensive datasets support cutting-edge research in sustainability, climate, and biodiversity, enabling their groundbreaking discoveries. Collaborated with more than 100 global academic institutions.
- Corporates: YoujiVest offers comprehensive ESG reporting services aligned with international standards, along with customized strategies to enhance third-party ESG ratings and ESG sectors. Our tailored solutions support corporate sustainability initiatives, including pollutant prevention, climate risk resilience planning, natural capital analysis, and supply chain management.