Emeritus
Reinsurance

The Impact of Climate Change on Re/Insurers

Climate Change

- Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, but since the 18th /19th Century, human activities have been the main drivers of climate change, primarily due to the burning of fossil fuels (like coal, oil and gas), which produces heat-trapping gases.***(United Nations).***
- Burning fossil fuels generates **greenhouse** gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures.
- The main gases that are causing climate change are carbon dioxide and methane

Climate change cont…

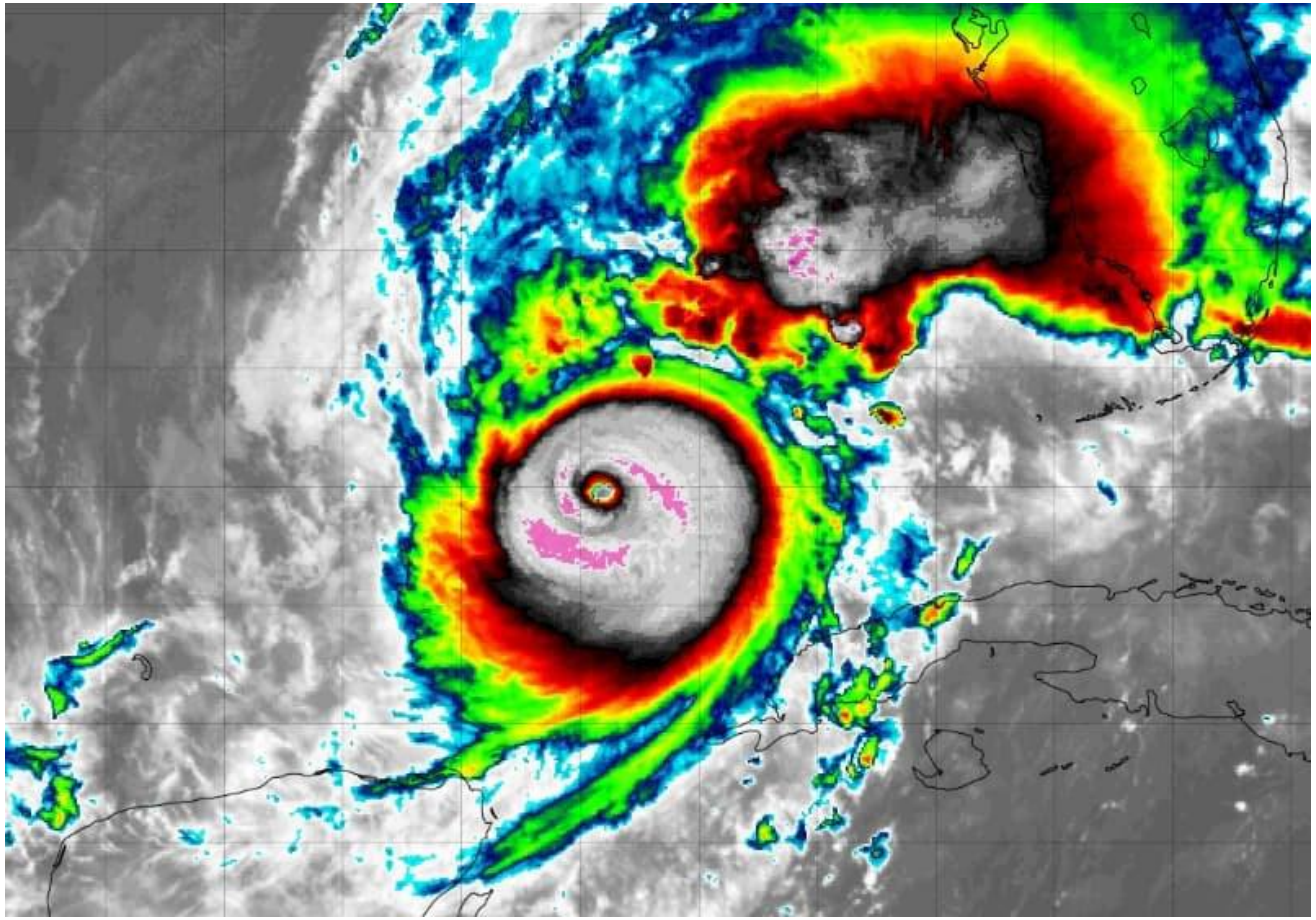
- Energy, industry, transport, buildings, agriculture and land use are among the main sectors causing greenhouse gases.
- The challenge is that without these industries we can not survive. We all need food, we all need energy and transport(We can not do without these sectors)

- Average global temperature has risen by 1.1°C since the pre-industrial era, with projections suggesting a 2-3°C rise if emissions continue at current rates.
- Natural disaster claims have increased by 250% since 1980 due to climate events (Swiss Re).
- Climate-related disasters in 2023 cost around $295 billion globally (Munich Re).

How Cyclones are formed

- Tropical cyclones require warm ocean water with surface temperatures of at least 26°C to form and strengthen. When warm and moist air rises above the ocean, it is called convection. In layers of air up to 5 km high, it cools again and condenses, releasing heat energy that drives the storm. The released heat energy remains in the troposphere and the air pressure there increases. The higher air pressure spreads out and creates a suction effect that pulls in more moist air from below. The Earth's rotational motion causes the storm to spin and develop into a tropical cyclone.

Hurricanes/Cylones/Typhoons



Cyclone Classification

- Tropical cyclones are classified into different categories from 1 to 5 using the Saffir-Simpson scale. The decisive criterion here is the wind speed.

Tropical depression	< 61 km/h	< 38 mph
Tropical storm	62 - 118 km/h	39 - 73 mph
Category 1	119 - 153 km/h	74 - 95 mph
Category 2	154 - 177 km/h	96 - 110 mph
Category 3	178 - 208km/h	111 - 129 mph
Category 4	209 - 251 km/h	130 - 156 mph
Category 5	> 251 km/h	> 156 mph

Global Hurricane Season 2024-25

- Hurricanes occur in the Atlantic basin mostly around florida & Gulf of Mexico(USA) . Huge losses both insured and uninsured losses occur more often.
- According to Aon's report in Reinsurance news , Hurricane Helene and Hurricane Milton insured losses are projected to range from US$36billion to US$54billion.
- https://www.reinsurancene.ws/re-insurers-well-placed-to-absorb-helene-milton-losses-of-up-to-54bn-aon/

Typhoons

- Typhoons occur in East Asia affecting countries like India, China, Thailand etc
- A recent study by the Chinese University of Hong Kong reveal that Typhoons have become dramatically more destructive in Asia over the past 40years and sometimes they move up to 190 km inland.
- The study also revealed that between 1979-2016 typhoons are making stronger landfall and are lasting 2 to 9 hours longer.

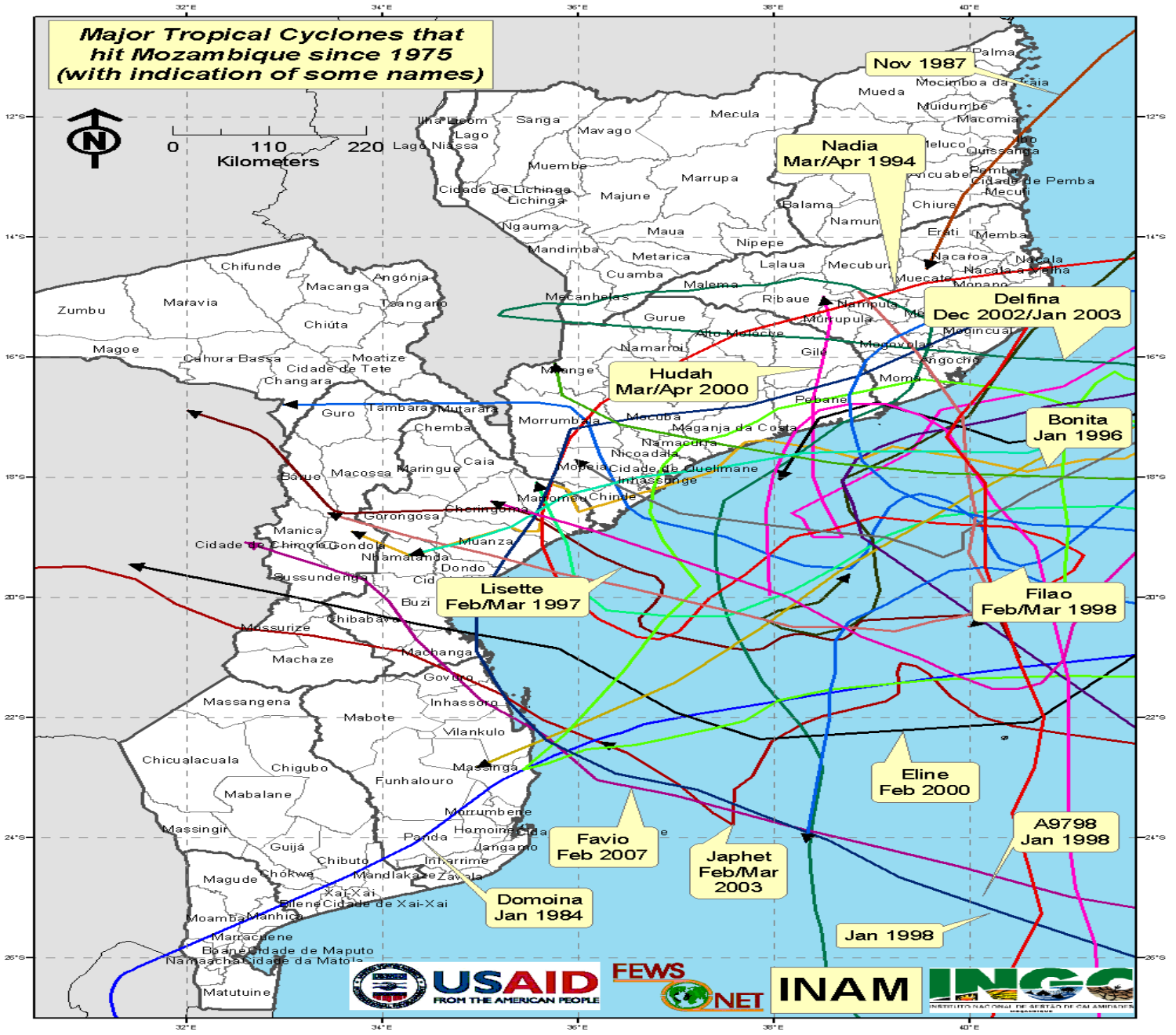
Cyclone Seasons in East Africa

- Cyclones are prevalent between January to March, in 2019 Cyclone Kenneth occurred in April.(exceptional but likely to recur).
- Highly exposed countries are Madagascar,Mozambique ,Mauritius(sometimes hitting hinterland countries i.e Zimbabwe, Malawi).
- **Mauritius has learnt to copy with cyclones through improving building structures (use mostly concrete roofs).**
- Madagascar and Mozambique do not have such standards, I suppose most countries in our region do not have.
- One big challenge in this region is non availability of credible data and quantification of both insured and uninsured losses {This could impact how stakeholders respond}.

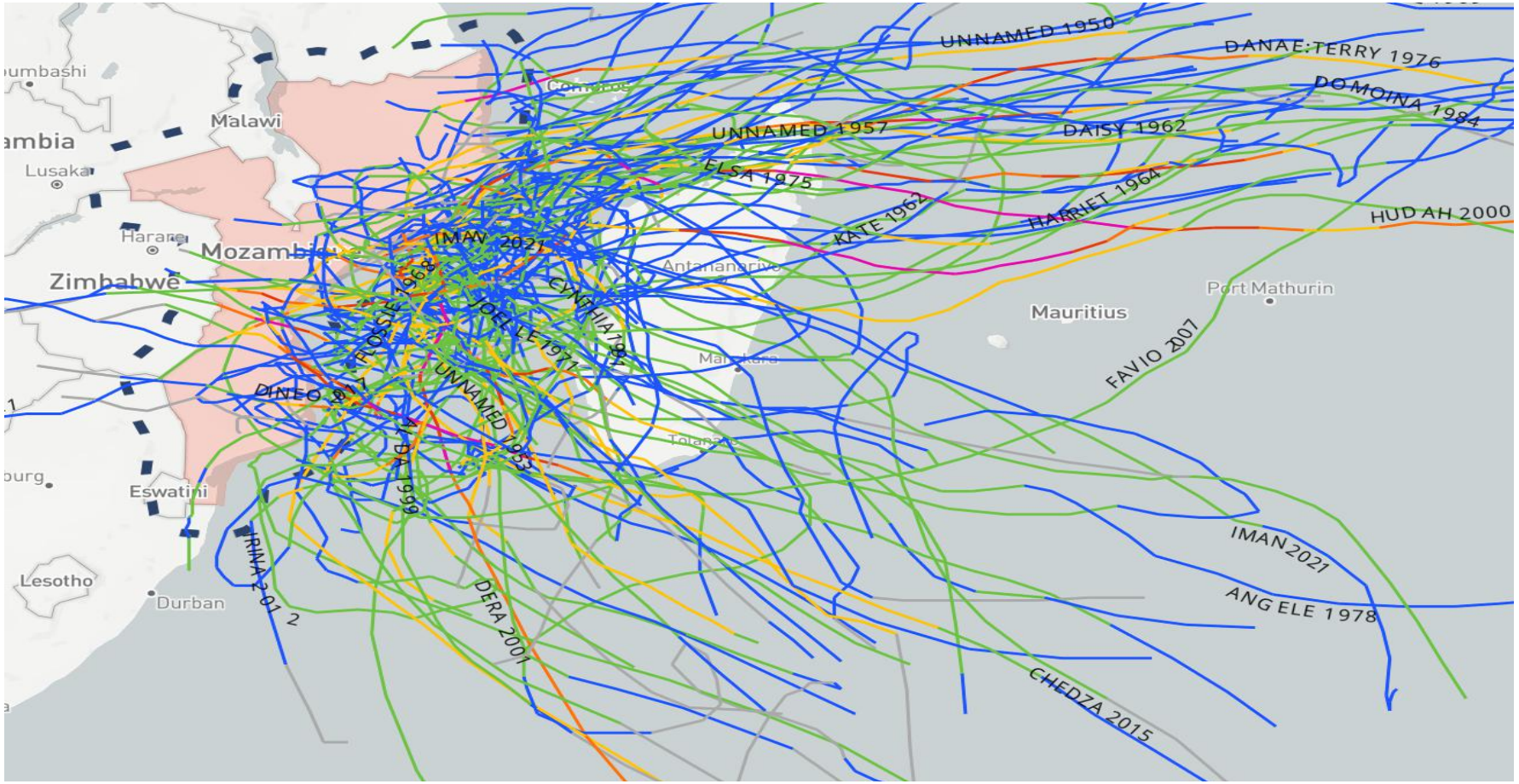
Mozambique

- Mozambique is among the ten countries most vulnerable to the impact of climate change,
- In Africa between 2012-24, more than 59 disasters were declared, including 15 tropical cyclones and 39 above-normal rains, which affected more than 8.9 million people who are still in need of urgent humanitarian aid.
- Weather forecast points to Lanina(excessive rainfall in 2024-25 season)
- The Mozambique Ministry of Finance reported that, based on climate projections, it is estimated that real growth could be 0.7pp (percentage points) below the potential capacity of the national economy.(*loss of US$126million dollars).*

Major Cyclones to hit Mozambique 1975-2007



Mozambique cyclones up to 2021



Cylones categories

	Date Range	Max wind speed	Diameter	Max Category
FILIPO	11-13 March 2024	111	772	TS
FREDDY	2-14 March 2023	183	900	H1
FREDDY	6-24 February 2023	111	556	TS
FREDDY	4-24 February 2023	111	485	TS
CHENESO	17-19 Jan 2023	137	963	H1
GOMBE	8-14 March 2022	183	593	H3
ANA	20-25 Jan 2022	93	611	TS
JOBO	17-24 April 2021	98	333	TS
GUAMBE 2021	11th February 2021	90	960	H2
ELOISE 2021	11th January 2021	90	968	H2
CHALANE 2020	20th Dec 2020	70	985	H1
KENNETH 2019	21st -28thApril 19	125	934	H4
IDAI 2019	13-14th March 2019	115	948	H4

GDP GAP DUE TO CLIMATE CONDITIONS

- The output gap is the difference between the current Gross Domestic Product (GDP) and the potential GDP of a given country, which can be positive or negative, and which measures the cyclical fluctuations of a given economy.

Gráfico 21: Crescimento Real Comparado ao Potencial da Economia

Fonte: INE, Potencial – cálculos com base no Filtro HP (Hodrick-Prescott)

Cyclone Idai

- Cyclone Idai is said to have caused damages worth US$1,4billion, of which insured losses remains unknown .
- Based on my experience in the market insured losses could be between 3%-5% thereby leaving a protection gap of 95%-97%.

Impact of Climate change on Agriculture

- In Mozambique Most crop farming is undertaken in low lying areas which are prone to flooding.(Provinces :Zambezia, Sofala,Maputo & Gaza)
- 95% of Agriculture production is done by smallholder farmers who depend on rain hence the Agriculture sector is highly vulnerable to climate change.
- Mozambique's Ministry of Land and Environment 2021 suggests that climate change could reduce yields by as much as 25 percent
- Maize is likely to be most affected by climate change from the main crops in Mozambique declining by 15% by 2050 under a high emissions scenario (Food security threat).

Impact of climate change on Power generation

- Climate change is generally expected to reduce Mozambique's hydropower capacity. (Uamusse, Tussupova, and Persson (2020) project that reduced runoff to hydropower stations due to climate change make it impossible to use their maximum capacities, resulting in a 10–20 percent decline in total power generation available annually in the 21st century. In particular, the study estimates that electricity output of the Cahora Bassa hydropower plant will be reduced by **20 percent by** 2100
- This will not only affect Mozambique's economy but Zimbabwe, South Africa, Zambia and Malawi.

Impact on other sectors

- Flooding will affect accessibility to Maputo Port and Beira port, thereby affecting exports and imports from the region.
- Food security will be affected in the region and worldwide
- Mozambique is becoming a major exporter of high carbon emission products , coal, gas and aluminium, with the worldwide drive to reduce carbon emission demand for these products will decline.
- Damage to infrastructure like roads and bridges and dams.

Climate Change's Impact on the Insurance Industry

- Increasing Claims:
  - In 2023, insurance claims from natural disasters exceeded $150 billion globally, marking the year one of the costliest years on record (Munich Re).
- Higher Premiums & Coverage Limits:
  - Climate risks may lead to higher premiums and limited coverage availability, especially in high-risk areas like coastal zones.
- Withdrawal of Coverage:
  - Companies like Allstate and State Farm have reduced or withdrawn coverage in high-risk areas like California due to wildfire risks.

Insurers Adapting with Climate-Related Products

- Africa Risk Capacity/Zurich Insurance:
  - Offers parametric insurance for extreme weather events, automatically triggering payouts when specific thresholds are met.
- AXA Climate:
  - Created “Climate School” to help clients manage climate risks and offers policies that encourage eco-friendly practices, like green building upgrades after damage.
- Swiss Re:
  - Provides insurance solutions for renewable energy projects (e.g., solar, wind) and is active in providing coverage for green infrastructure.

Green Investment Strategies in Re/Insurance

- Allianz SE/Sanlam:
  - Committed to a 25% reduction in CO_2 emissions for investments by 2025 and a net-zero portfolio by 2050. Allianz is shifting funds toward green bonds, sustainable infrastructure, and renewable energy.
- Aviva:
  - The first major insurer to commit to net-zero emissions by 2040, Aviva has over $10 billion invested in low-carbon technologies and excludes coal companies from its portfolio.
- AXA Investment Managers:
  - As part of the AXA Group, they divested from companies with coal-based revenues and increased investment in green bonds by 50% to support sustainability goals.

Case Study Chubb: Underwriting and Investment Strategy on Climate Change

- Underwriting Policy for Coal:
  - Chubb was the first major U.S. insurer to restrict underwriting policies for coal mining and coal-fired power plants. As of 2019, Chubb ceased provides insurance to new coal-fired plants or mining projects and phases out existing coverage for clients with significant coal operations.
- Commitment to Transition:
  - Chubb is aligning its business practices to support the transition to a low-carbon economy. This includes prioritizing insurance products for renewable energy sectors such as wind and solar power.
- Environmental Liability Products:
  - Chubb offers specialized environmental liability products that cover green infrastructure projects and pollution prevention efforts, promoting cleaner industries and energy-efficient upgrades.
- Net-Zero Emissions Goal:
  - Chubb has committed to achieving net-zero greenhouse gas emissions across its own operations by 2050, integrating environmental risk factors into its underwriting and investment policies to ensure alignment with global climate targets.

Case Study Tokio Marine: Underwriting and Investment Strategy on Climate Change

- **Coal Exclusion Policy**:
  - In 2020, Tokio Marine announced it would stop underwriting new coal-fired power plants, reflecting its commitment to support a sustainable, low-carbon economy. This policy extends to divesting from coal investments.
- **Support for Renewable Energy**:
  - Tokio Marine actively underwrites renewable energy projects, including solar and wind energy. The company has a specialized team that tailors coverage for clean energy projects, focusing on providing financial resilience to this growing sector.
- **Sustainable Bonds**:
  - The company issues green and sustainability bonds to raise capital for projects that aim to reduce carbon footprints and environmental impacts. These investments support projects like energy-efficient buildings and climate-resilient infrastructure.
- **Research and Partnerships**:
  - Tokio Marine is heavily invested in climate research and collaborates with academic institutions to advance climate modelling. This helps the company understand and underwrite emerging climate risks, especially in Asia, where climate impacts are projected to be significant.

Underwriting Initiatives to Support Carbon Reduction

- Munich Re:
  - Provides coverage specifically for carbon capture and storage (CCS) projects, facilitating CO_2 capture, transport, and storage.
- Lloyd’s of London:
  - Encourages syndicates to underwrite green energy projects and introduced a policy to phase out coal underwriting by 2030.
- Hannover Re:
  - Offers "Green Solutions" that promote risk management for sustainable projects and applies ESG factors to determine coverage terms, incentivizing eco-friendly behaviour.

Climate Change Adaptation Strategies for Re/Insurance

- Enhanced Risk Modelling:
  - Advances in climate risk modelling, such as AIR Worldwide's Climate Change Impact Model, help re/insurers estimate potential losses more accurately.
- Diversification of Risk Pools:
  - By geographically and sectorally diversifying risk portfolios, insurers balance exposure to climate risks.
- Product Incentives:
  - Offering discounts on premiums for clients who adopt sustainable practices, such as fire-resilient building materials in wildfire-prone areas.

The Role of Re/Insurance in Supporting Climate Transition

- Green Bonds and Investments:
  - In 2023, the global insurance industry invested over $60 billion in green bonds, helping fund projects that align with net-zero targets.
- Promoting Renewable Energy:
  - Munich Re provides insurance products specifically for wind and solar farms, helping to expand renewable energy infrastructure.
- Climate Risk Advocacy:
  - Re/insurers actively participate in initiatives like the UN-convened Net-Zero Asset Owner Alliance to push for regulatory changes and industry alignment on climate action.

Recommended Response by Re/Insurers

- International In/reinsurance market are quick to respond with hard terms following major natural disasters like hurricanes and floods.
- International Reinsurance terms are in a hard cycle since post COVID.
- (Unfortunately, we are hardly see a similar response by African re/insurers due to competition).
- Risk Management is becoming critical to mitigate impact of climate change, hence insurers/reinsurers should invest in Risk Management.
- Lobby government for adverse wheather resistant buildings

Recommended Response by Re/Insurers

- **Dual Impact**:
  - Climate change affects both re/insurance products and operational sustainability of clients.
- **Urgency of Action**:
  - Climate adaptation and carbon reduction strategies are essential for resilience and long-term industry viability.
- **Re/Insurers should take ESG seriously and** play an important role in educating communities, sponsoring climate change mitigating project.
- Climate change mitigating measures should be inbuild in our underwriting requirements.
- **Research and partnerships:**
  - (Re)insurers in Zimbabwe and Africa should provide funding for academic research to enhance understanding of climate risk and enhance modelling.
- **Future Outlook:**
  - Ongoing investment in green products, innovations in risk assessment, and regulatory alignment are essential as climate risks evolve.

Muito Obrigado