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**Seminario del Comitato Scientifico dell'Ordine degli Attuari**

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# I CONTRIBUTI DEGLI ATTUARI AL PERCORSO DI SOSTENIBILITA' NELLE ASSICURAZIONI

*ACTUARIES IN THE SUSTAINABILITY JOURNEY: SUSTAINABILITY IN THE INSURANCE SECTOR*

Miriam Pedol, Finance, Generali International, Generali Group

*Milan, Italy  
14 Jan 2022*

*Disclaimer: This presentation does not necessarily reflect the official policy or position of Generali Group on the subject here reported*



# AGENDA

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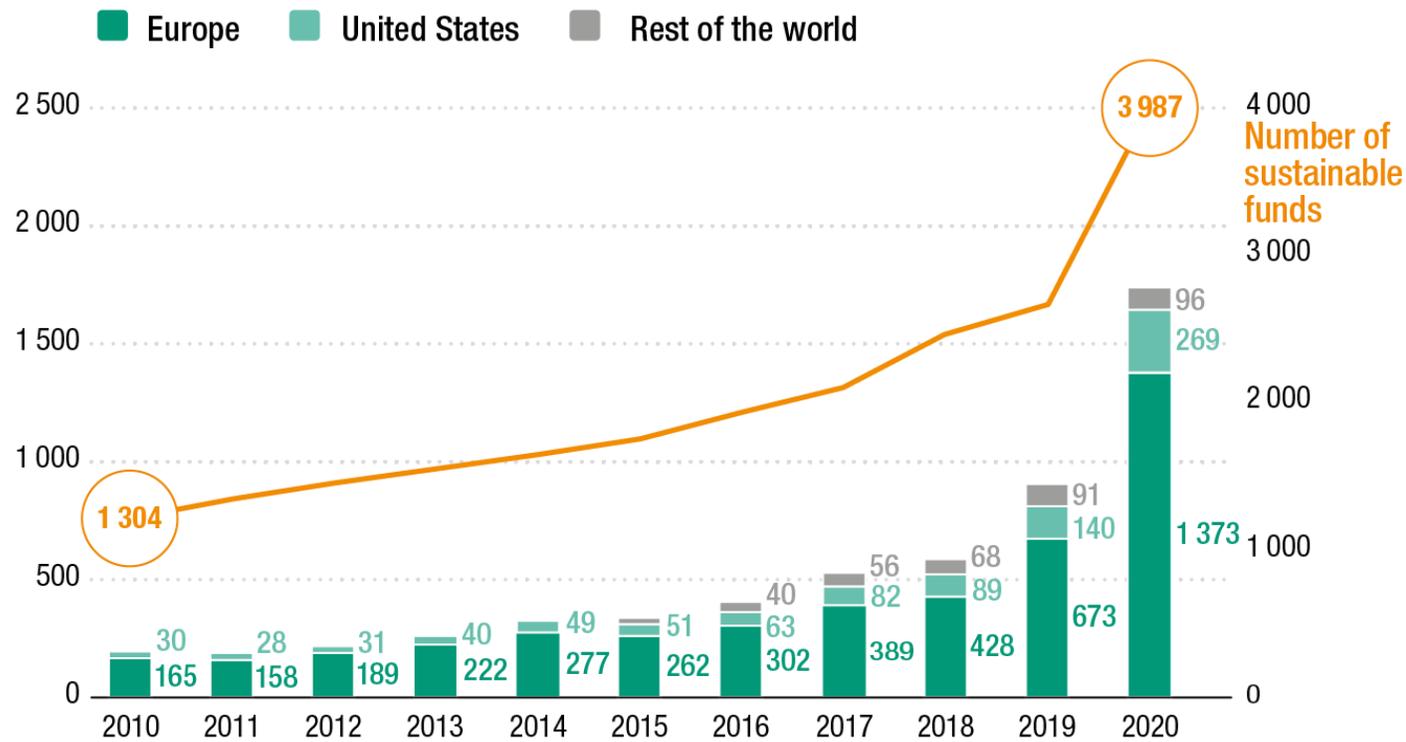
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# Sustainability: BACKGROUND

## Number and AUM of sustainability-themed funds, 2010-2020 <sup>[1]</sup>

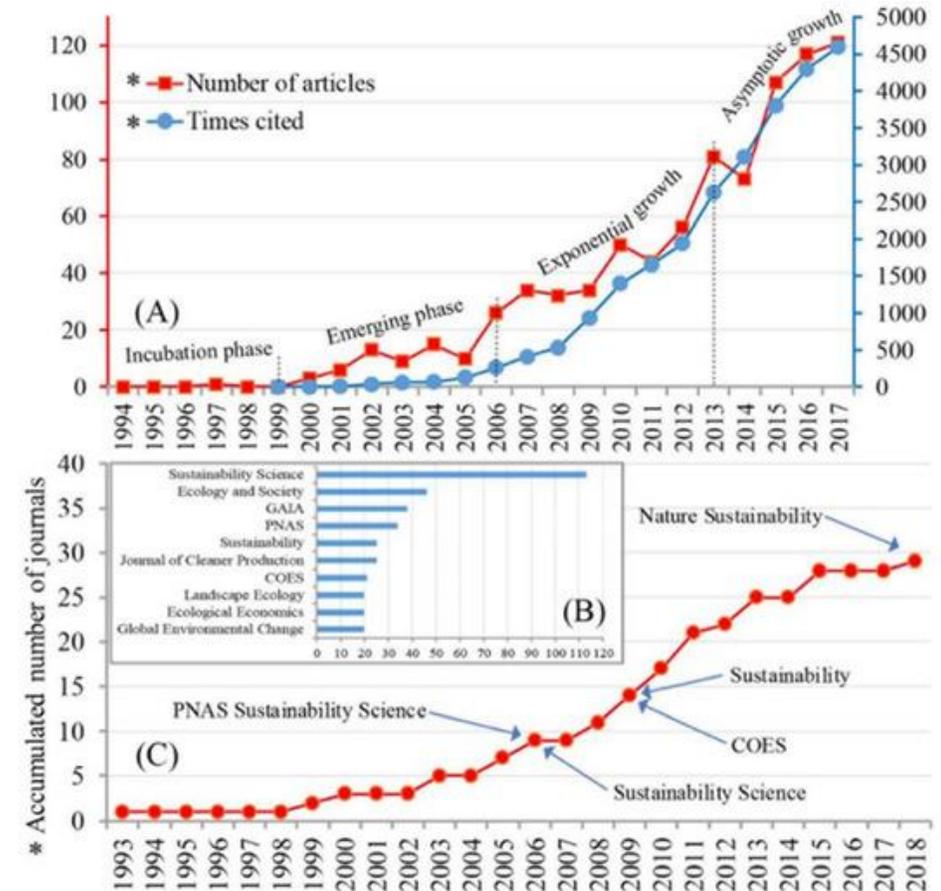
(Billions of dollars)



Source: UNCTAD, based on Morningstar and TrackInsight data.

Note: Numbers of funds do not include funds that were liquidated; the numbers for 2020 are as of 30 June.

## Growth trends of Sustainability Science <sup>[2]</sup>



# Sustainability: **CONCEPT**

DEVELOPMENT THAT MEETS THE  
NEEDS OF THE PRESENT, WITHOUT  
COMPROMISING THE ABILITY OF  
FUTURE GENERATIONS TO MEET  
THEIR OWN NEEDS <sup>[3]</sup>





# Sustainability as a BUSINESS APPROACH

If it emerges at all, a sustainable global economy will emerge through an era of intense technological, economic, social and political metamorphosis. We can distinguish four main types of 'value webs': 'locusts', 'caterpillars', 'butterflies' and 'honeybees'<sup>[4], [5]</sup>

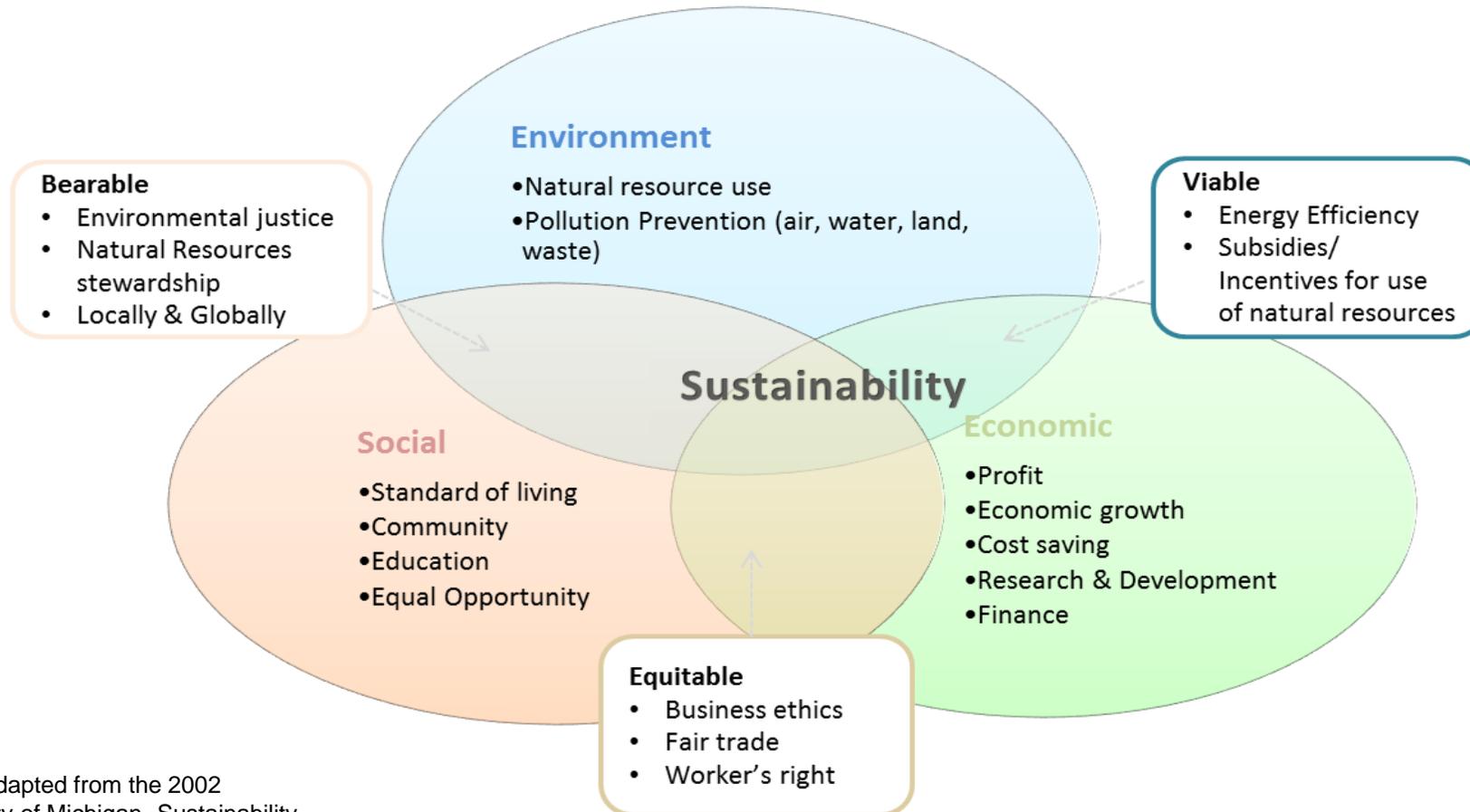


Image adapted from the 2002 University of Michigan -Sustainability assessment.



# Sustainability GAME (1/2)

the presence of **externalities** and “**free riders**” are conditions under which the fundamental theorem of welfare economics fails, because the market ceases to be the instrument of the optimal allocation of resources and moves away from the Paretian *equilibrium*...<sup>[6]</sup>

...BUT

**MORE AND MORE STAKEHOLDERS, INCLUDING GOVERNMENTS AROUND THE WORLD, ARE SHARING SUSTAINABILITY VALUES AND PRINCIPLES...**



**...WITH STRONG COMMITMENTS TO A MORE SUSTAINABLE ECONOMY AND SOCIETY**

| 7 GLOBAL TARGETS | Reduce  | Increase  |
|------------------|---|---|
|                  | <b>Mortality/</b><br>global population<br>2020-2030 Average << 2005-2015 Average                          | Countries with national & local DRR strategies<br>2020 Value >> 2015 Value  |
|                  | <b>Affected people/</b><br>global population<br>2020-2030 Average << 2005-2015 Average                    | <b>International cooperation</b><br>to developing countries<br>2030 Value >> 2015 Value   |
|                  | <b>Economic loss/</b><br>global GDP<br>2030 Ratio << 2015 Ratio   | <b>Availability and access</b><br>to multi-hazard early warning systems & disaster risk information and assessments<br>2030 Values >> 2015 Values |
|                  | <b>Damage to critical infrastructure &amp; disruption of basic services</b><br>2030 Values << 2015 Values |   |



PARIS2015  
UN CLIMATE CHANGE CONFERENCE  
COP21·CMP11



1. Sendai Framework – Disaster Risk Reduction (2015-2030)

2. The 2030 Agenda - Social development goals

3. Paris COP21 – Climate Change

4. Glasgow COP26 - UN Climate Change Conference

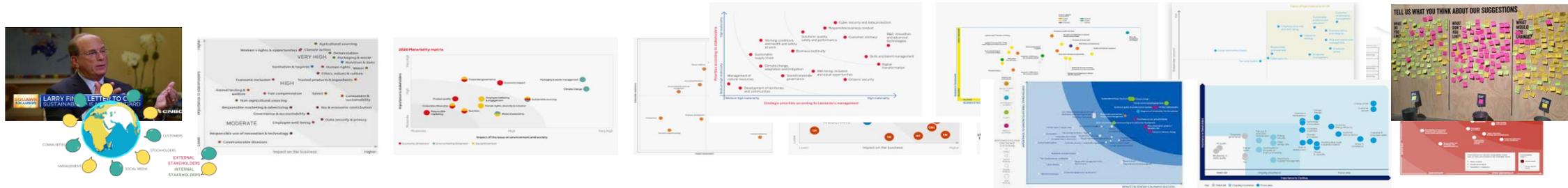


# Sustainability GAME (2/2)

## A SUSTAINABLE FRAMEWORK PRODUCES WEALTH OVER TIME

The Sustainability Game demonstrates how sustainability can engage the economic system in a market shift <sup>[7]</sup>

THE MORE COMPANIES CONSIDER THE SUSTAINABILITY INTEREST OF RELEVANT STAKEHOLDERS ...



.... AND RECEIVE POSITIVE FEEDBACK FOR THEIR RESULTS ...



... THE MORE COMPANIES COULD BENEFIT BY MORE NEW BUSINESS OPPORTUNITIES



SUSTAINABILITY GAME:

- dynamic multi-stage game in which sustainability is a value that is shared between companies and stakeholders in a competitive market
- the game solution could move from a Nash equilibrium to a higher equilibrium, the MES equilibrium, because of the presence of stakeholders who influence the choice and the set of sustainable strategies



# Sustainability and ESG factors, risks and analysis

- ESG **factors** contribute to ESG objectives <sup>[8]</sup>
- *Sustainability risks* are operationalised via/stem from the concepts of ESG **risks**
- ESG **analysis** are related to **business impacts** affecting for example:
  - estimated **future cash flows** (issues and opportunities)
  - parameters used in the **financial analysis** (e.g. costs, revenues, capex, beta, etc.)
  - **value in the m/I term** of business models



## ENVIRONMENTAL



## SOCIAL



## GOVERNANCE

objectives

- *climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, waste prevention and recycling, pollution prevention and control and protection of healthy ecosystems*
- *tackling inequality, fostering social cohesion, social integration and labour relations, or an investment in human capital or economically or socially disadvantaged communities*
- *good governance practices, and in particular companies with sound management structures, employee relations, remuneration of relevant staff and tax compliance*

issues

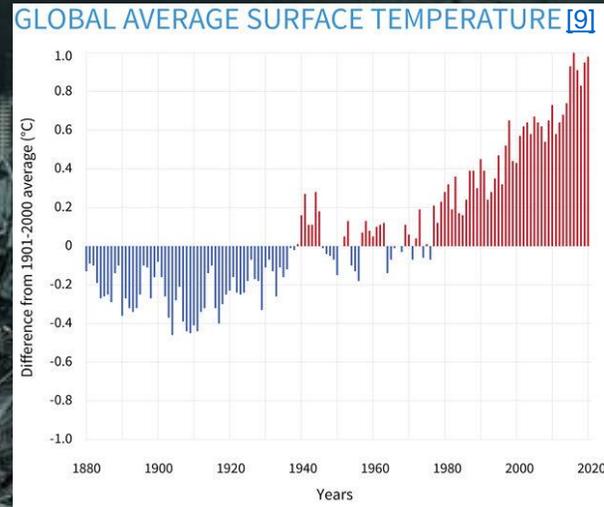
- *the quality and functioning of the natural environment and natural systems*
- *the rights, well-being and interests of people and communities*
- *the governance of companies and other investee entities*

Extreme weather events and natural disasters will have an increasing impact.



# Which climate change-related risk? <sup>[8]</sup>

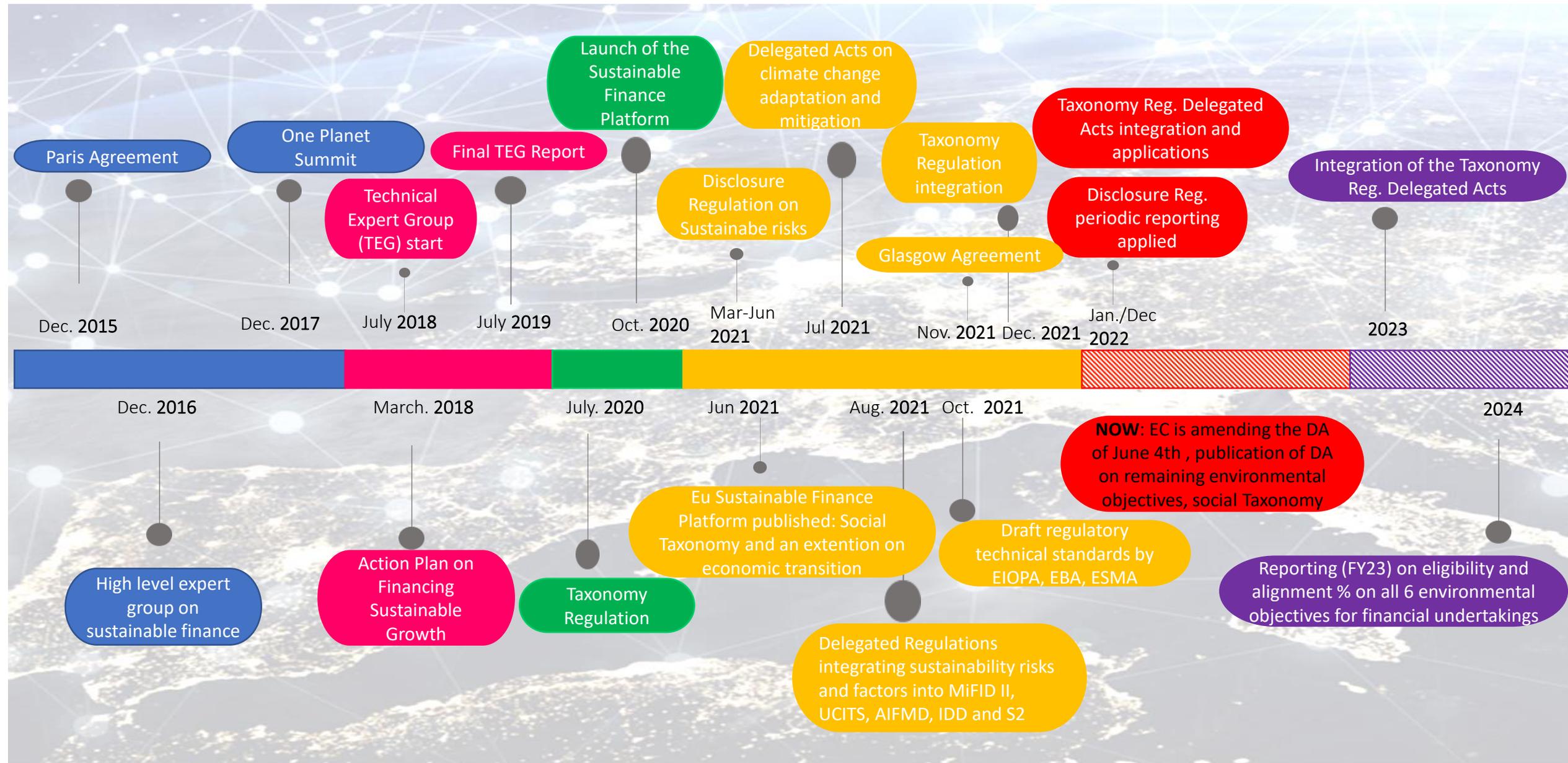
- (1) risks related to the **transition** to a lower carbon economy
- (2) risks related to the **physical** impacts of climate change
- (3) **liability** risks from people or businesses seeking compensation for losses caused by (1) & (2)





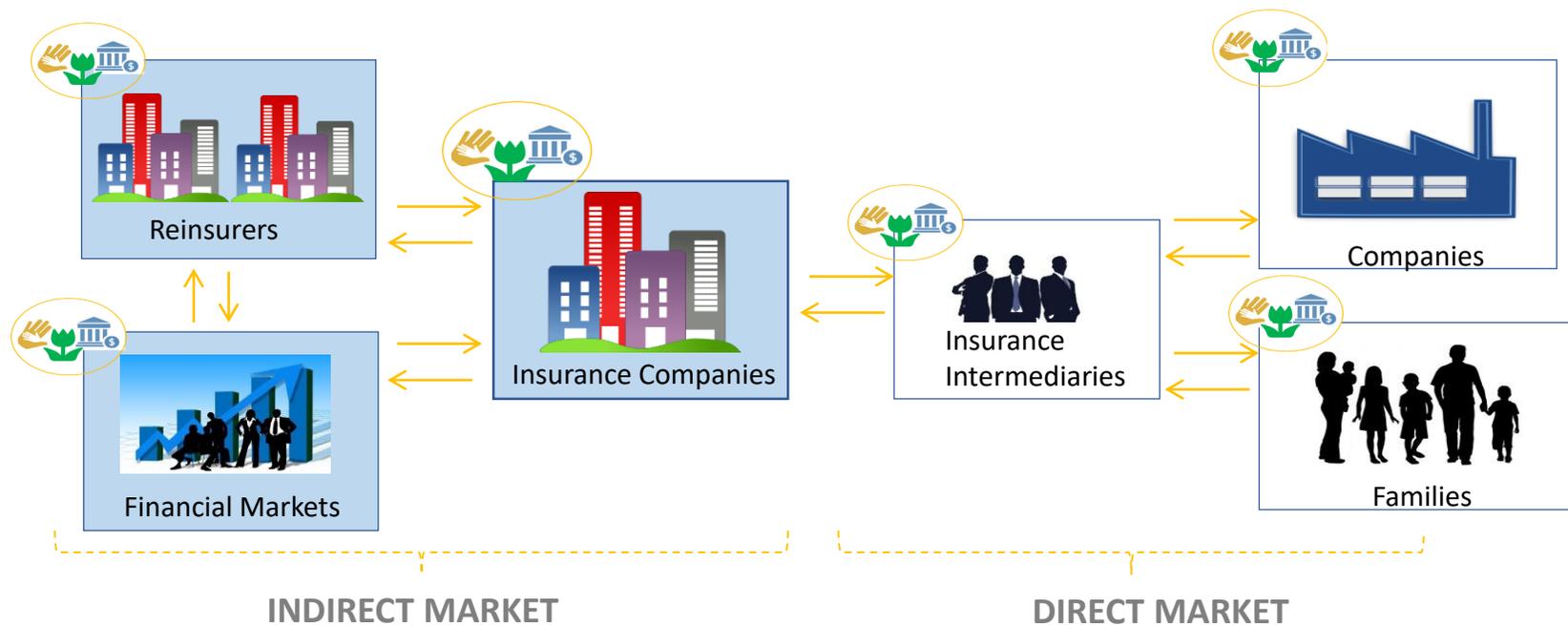
# Sustainability PATH (high level overview)

2021 has been significant for the sustainable finance agenda





# A sustainable INSURANCE SECTOR framework



## ACTUARIES possible contributions ...

*(Re)insurers are both:*

- i. Users of the Taxonomy as institutional investors; and*
- ii. Eligible as underwriters for environmental (and social) objectives*



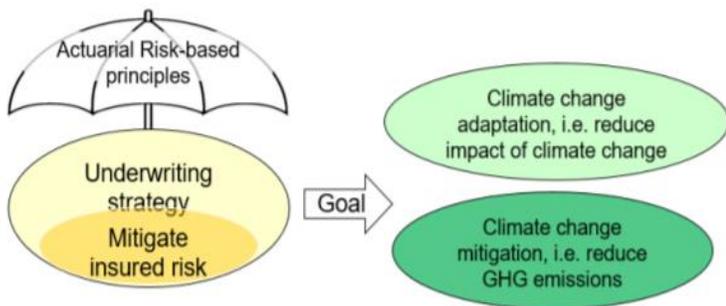


# Climate-change and Non-Life Insurance Pricing

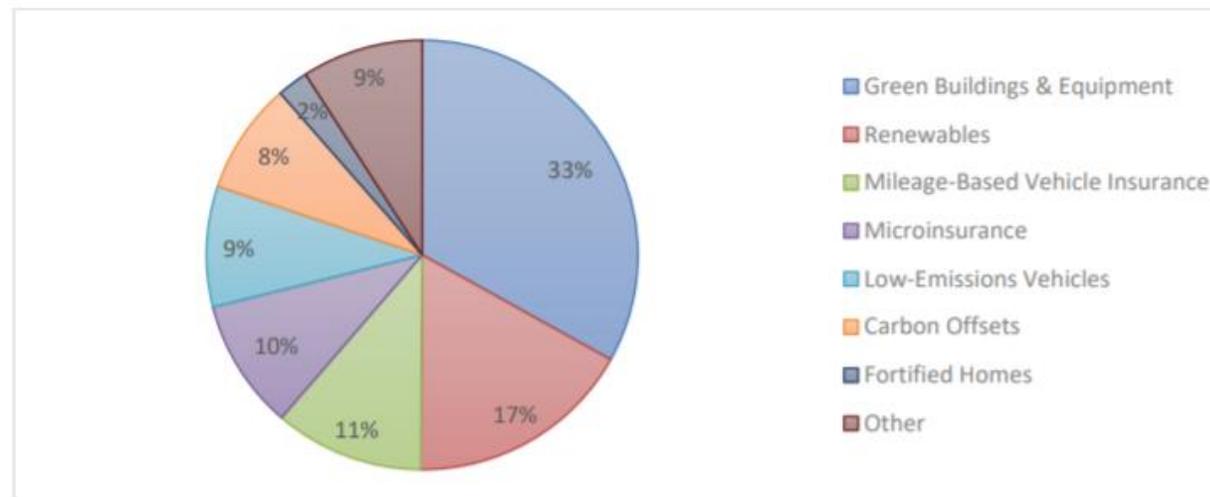
- Non-life insurance has been recognized by the TEG to be an activity which could significantly contribute to climate change adaptation
- EIOPA published *Report on non-life underwriting and pricing in light of climate change* (2021) [\[10\]](#)
- As underwriters of natural catastrophe risks, the (re)insurance sector can be particularly impacted by climate change: the climate-related losses are expected to grow and widening the protection gap

## Definition of impact underwriting

Consistently with actuarial risk-based principles, (re)insurers, as risk managers and underwriters, can contribute to climate adaptation and mitigation by applying their data, expertise and risk assessment capacity to incentivise policyholders to mitigate insured risks via risk-based pricing and contractual terms, and consider in their underwriting strategy measures that contribute to climate change adaptation and/or mitigation.



## Type of products available in the Climate Smart Insurance products database.



- Net-Zero Underwriting Alliance (UN): leading insurance companies have started making public commitments towards net-zero underwriting objectives, ie alignment of business activities with the 1.5C warming pathway



# Actuaries in the sustainability **JOURNEY**

forward looking models for sustainability means that actuaries are in a position to support the analysis of long-term risk factoring ESG impacts

Actuaries have the possibility to:

- work with other disciplines to enable a fully integrated approach
- collect and analyze new data set/phenomena
- map and define new risks
- develop innovative actuarial sustainability models
- ....



# Main TAKEAWAYS and CONCLUSIONS

## SUSTAINABILITY IS A VALUABLE STRATEGY

**INSURANCE COMPANIES CAN RECOGNIZE SUSTAINABILITY AS A BUSINESS OPPORTUNITY** to attract capital, to price properly insurance risks and to generate and maintain value over time, **AND SIGNIFICANTLY CONTRIBUTE TO ESG OBJECTIVES**

**ACTUARIES ARE PERFECTLY SUITED TO IDENTIFY AND QUANTIFY SUSTAINABILITY RISKS, DEVELOP AND EXECUTE ESG MITIGATION SOLUTIONS**



A **Green Swan** is a *profound market shift*, generally catalyzed by some combination of Black or Gray Swan challenges and changing paradigms, values, mind-sets, politics, policies, technologies, business models, and other key factors. A Green Swan delivers *exponential progress in the form of economic, social, and environmental wealth creation*. [\[11\]](#)



# Main REFERENCES

- [1] UNCTAD (2021). World Investment Report 2021, Investing in Sustainable Recovery.
- [2] González-Márquez, I. and Toledo, V. M. (2020). Sustainability Science: A Paradigm in Crisis?. Sustainability 2020, 12(7), 2802. <https://doi.org/10.3390/su12072802>.
- [3] WCED (1987). Our common future. Oxford: Oxford University Press.
- [4] Elkington, J. (2001). The chrysalis economy: How citizen CEOs and corporations can fuse values and value creation. Capstone, Oxford.
- [5] Elkington, J. (1999). Cannibals with forks: The triple bottom line of 21st century business. Capstone: Oxford.
- [6] Pigou, A.C. (2013). The economics of welfare. New York, NY: Palgrave Macmillan.
- [7] M. Pedol, E. Biffi, S. Melzi (2021). Sustainability Game, published by Corporate Social Responsibility and Environmental Management, J. Wiley and Sons, 28(5), <https://doi.org/10.1002/csr.2182>.
- [8] EIOPA (2019). Opinion on Sustainability within Solvency II, EIOPA-BoS-19/241, Frankfurt am Main, 30 April 2019.
- [9] Lindsey R., and Dahlman, L. (2021). Climate Change: Global Temperature. NOAA Climate.gov.
- [10] EIOPA (2020). Discussion Paper on Non-Life Underwriting and Pricing in Light of Climate Change. EIOPA-BoS-20/669, Frankfurt am Main, 10 December 2020.
- [11] Elkington, J. (2020). Green swans: The coming boom in regenerative capitalism. Fast Company Press.
- [12] EIOPA (2021). Sustainable Finance Activities 2022-2024.
- [13] Pedol M. (2019). Sustainability as a Strategic risk approach: Sustainability Option into Non-Life Insurance Pricing, paper presented at 2019 AFIR/ERM Colloquium, Florence – Italy, May 21-24.
- [14] CRO Forum (2020). Imagine all the People: Demographics and social change from an insurance perspective. Emerging Risk Initiative, Position Paper.
- [15] Principle for Sustainable Insurance: framework and initiative of the United Nations Environment Programme Finance Initiative.



Q&A.



THANK YOU.