

# Turning Risk Professionals Into Climate Specialists

CLAR Conference 2021



## **Michael Sell, Senior Vice President, Global Institutional Outreach**

Michael transitioned to GARP from the financial services industry with experience across various roles in financial risk management, structured products, and investment management. Before joining GARP he was the Operating Officer at a New York based investment advisor for an alternative investment fund. Prior to that he was a Vice President and Credit Officer in Citigroup's Global Derivatives Group.

# Outline

- **What should risk professionals understand about climate change?**
- How should risk professionals be thinking about climate driven risk?
- What market insights should risk professionals be aware of?
- How can risk professionals learn more?

# Climate Change is Different than Other Risk Factors

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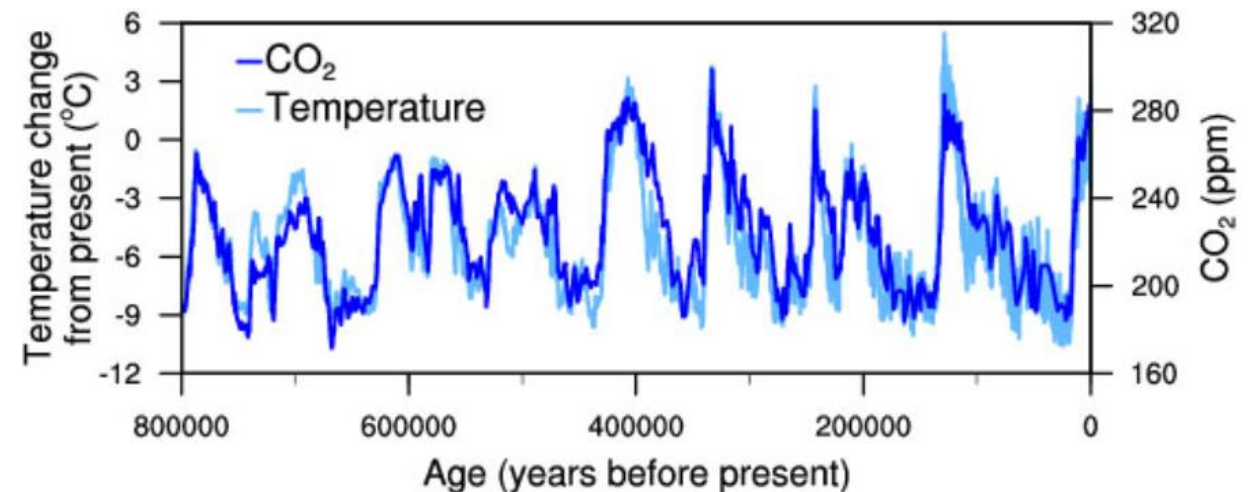
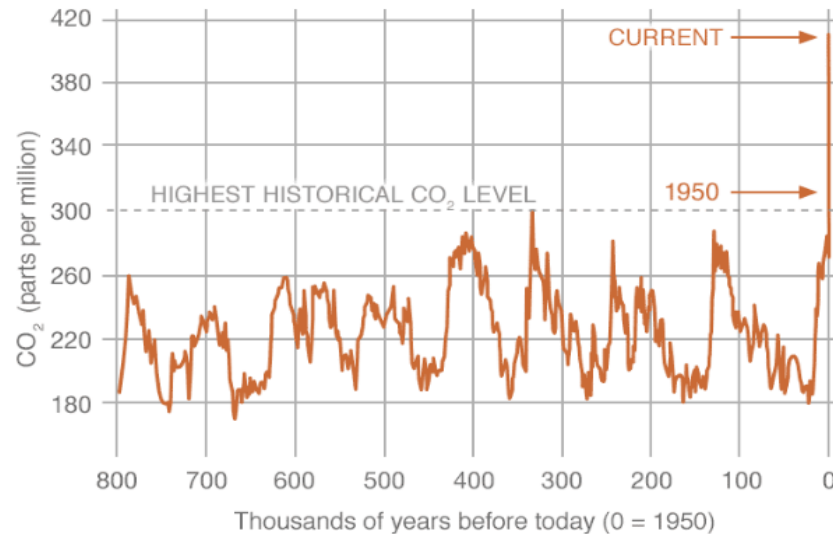
## □ Potential impacts are

- Far reaching in breadth and magnitude
- Foreseeable
- Irreversible
- Dependent on short-term actions



# Greenhouse Gas Emissions and Rising Global Temperatures

- Since 1950, atmospheric CO<sub>2</sub> has increased to levels not seen in the last 800,000 years
- Global temperatures are correlated with carbon dioxide (CO<sub>2</sub>) in the atmosphere
- Global temperatures are rising and will continue to rise



<https://www.ncdc.noaa.gov/global-warming/temperature-change>  
<https://climate.nasa.gov/vital-signs/carbon-dioxide/>  
[https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5\\_SPM\\_FINAL.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_SPM_FINAL.pdf)

# 2015 Paris Accord Accelerated Global Climate Action









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- International Treaty with “Nationally Determined Contributions” (NDCs) designed to reduce GHG emissions and hold the increase in global average temperature to well below 2-degrees Celsius.
  
- Paris Accord has supported climate mitigation and sustainable development initiatives by:
  - Signaling to markets that long-term political objectives of international community are aligned.
  - Creating government incentives to support low-carbon business decisions.
  - Encouraging and supporting voluntary action by private sector actors.
  
- Five trends provide proof
  - Increasing Commitment to Net Zero Goals
  - Regulators are Becoming More Climate Focused
  - The Climate Landscape is Increasingly Complex
  - The Number of Climate Laws and Policies is Growing
  - Investor Influence on Climate Action is Growing





# Trend #1: Increasing Commitment to Net Zero Goals

## Warming by 2100

### Physical impacts

	<2 °C	3 °C	5 °C
	1.5 °C	2 °C	
 Sea-Level Rise (cm)	0.3-0.6 m	0.4-0.8 m	0.4-0.9 m
 Coastal assets to defend (\$tn)	\$10.2tn	\$11.7tn	\$14.6tn
 Chance of ice-free Arctic summer	1 in 30	1 in 6	4 in 6 (63%)
 Tropical cyclones: Fewer (#cat 1-5)	-1%	-6%	-16%
Stronger (# cat 4-5)	+24%*	+16%	+28%
Wetter (total rain)	+6%	+12%	+18%
 Frequency of extreme rainfall	+17%	+36%	+70%
 Increase in wildfire extent	x1.4	x1.6	x2.0
 People facing extreme heatwaves	x22	x27	x80
 Land area hospitable to malaria	+12%	+18%	+29%

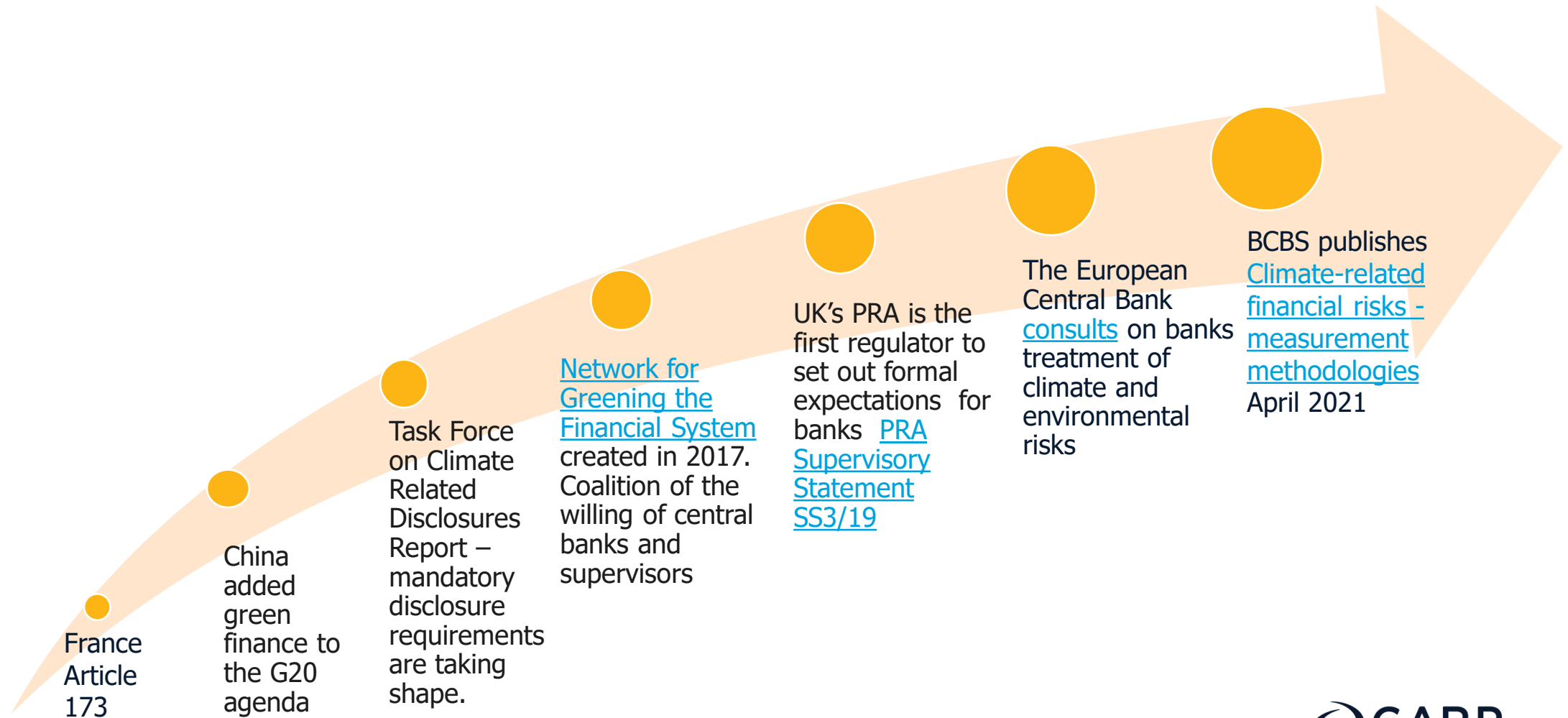
### Economic impacts

 Global GDP impact (2018: \$80tn)	-10%	-13%	-23%
 Stranded assets	Transition: fossil fuel assets (supply, power, transport, industry)	Mixed: some fossil fuel assets mothballed, some physical stranding	Physical: uninhabitable zones, agriculture, water-intensive industry, lost tourism etc
 Food supply	Changing diets, some yield loss in tropics	24% yield loss	60% yield loss, 60% demand increase
 Insurance opportunities	New low-carbon assets and infrastructure investment (e.g. CCS)	Increasing demand to manage growing risks	Minimal: recession, tensions, high and unpredictable risks

The data used in this infographic is sourced from IPCC data and other sources as listed in the Bibliography (incl Raftery et al, Schlosser et al, Jevrejeva et al, Knuston et al, Turco et al, Huang et al, Pretis et al, and Burke, Hsiang & Miguel)

- Reaching net zero by 2050 is consistent with limiting global warming to 1.5 degrees
- Helping to limit the more extreme physical risks of higher temperature rises

## Trend #2: Regulators are Becoming More Climate Focused



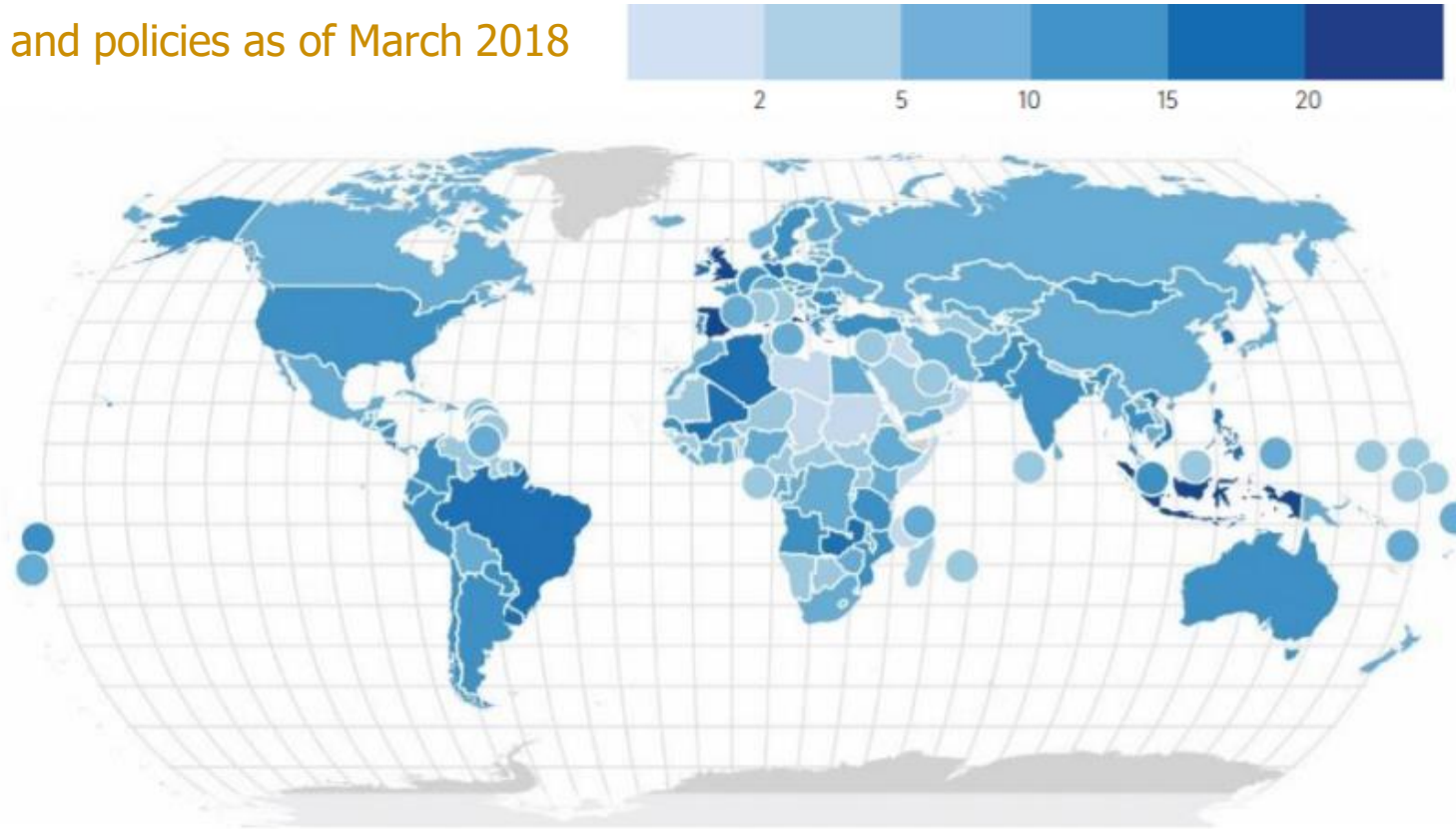


# Trend #3: The Climate Landscape is Increasingly Complex



## Trend #4: The Number of Climate Laws and Policies is Growing

Number of climate laws and policies as of March 2018



Source: <https://www.lse.ac.uk/granthaminstitute/publication/global-trends-in-climate-change-legislation-and-litigation-2018-snapshot/>

## Trend #5: Investor Influence on Climate Action is Growing

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- Fund flows into green energy investment totals more than USD 280B in 2020
- Netherlands court decision ordering Shell to cut emissions
- Activist hedge fund Engine No. 1 wins 2 seats on ExxonMobil's Board of Directors

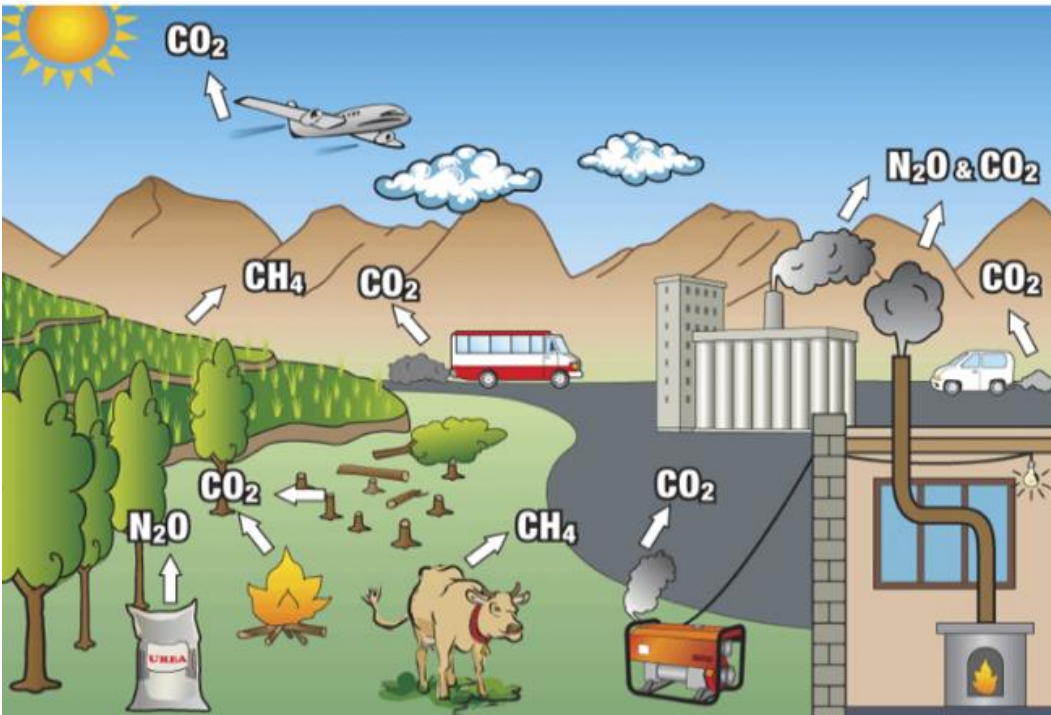
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# Two Perspectives on Climate Change and Risk

## Our impact on the climate



Source: <https://www.climateemergencyinstitute.com/glemissions.html>

## Climate's impact on us



Source: Phil Creighton <https://www.wokinghampaper.co.uk/mill-lane-closed-due-to-flooding-hotel-is-open-but-dont-try-and-charge-your-car/>

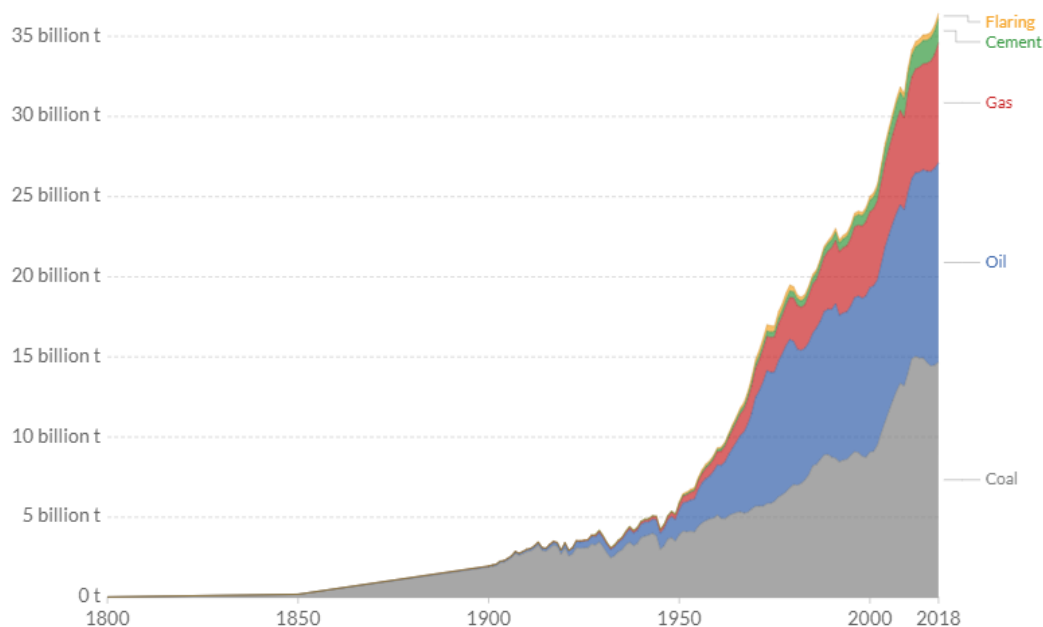


# The Energy Industry is One Example

## Industry's impact on the climate

### CO<sub>2</sub> emissions by fuel type, World

Annual carbon dioxide (CO<sub>2</sub>) emissions from different fuel types, measured in tonnes per year.



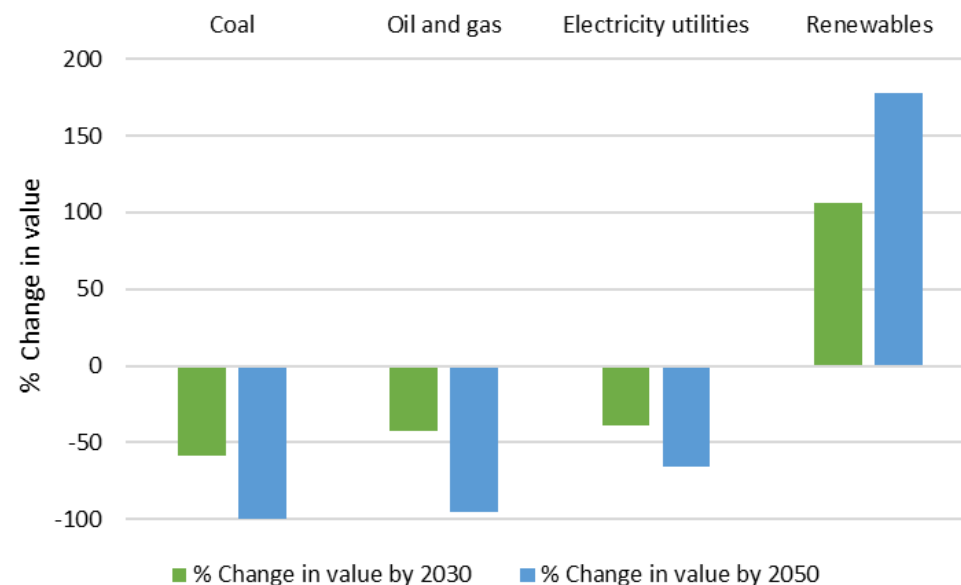
Source: Global Carbon Project (GCP): CDIAC

CC BY

Source: <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>

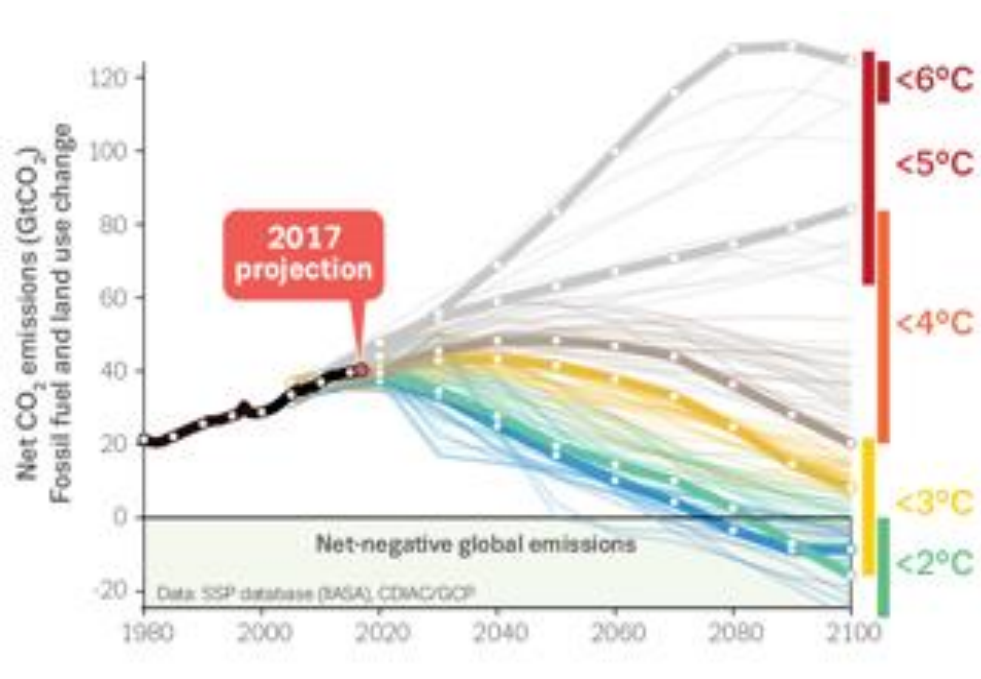
## Climate's impact on the industry

Market value will decline as global warming is limited to 2°C



Source: <https://www.mercer.com/our-thinking/wealth/climate-change-the-sequel.html>

# Climate Change Results in Physical and Transition Risks



Sources: Global Carbon Project (2017), based on Bank of England (2018)

Physical risks – arising from climate change (eg storms, wildfires, rising sea level)

Transition risks – arising from the adjustment towards a low-carbon economy (eg policy, legal, technology changes, reputational risks)

# Physical Risk can be Acute or Chronic and Direct or Indirect

Acute	Chronic
<b>Specific and severe weather events</b> <ul style="list-style-type: none"><li>• Heatwaves, wildfires, flooding, or more severe storms</li></ul>	<b>Permanent alterations in conventional weather patterns.</b> <ul style="list-style-type: none"><li>• Changes in precipitation, rising sea levels, or an increasing average global temperature</li></ul>
<b>Direct Risks (direct impact)</b> <ul style="list-style-type: none"><li>• Higher and more frequent property damage insurance claims</li><li>• Mortality rates increase due to unusual heatwave events.</li></ul>	<b>Direct Risk (direct impact)</b> <ul style="list-style-type: none"><li>• Rising temperatures create more uninhabitable regions.</li><li>• Changing precipitation patterns reduce crop yields.</li></ul>
<b>Indirect Risks (second order effects)</b> <ul style="list-style-type: none"><li>• Reduced property values due to increasing flood risk.</li><li>• Supply chain disruptions created by severe weather events.</li></ul>	<b>Indirect Risks (second order effect)</b> <ul style="list-style-type: none"><li>• Higher cooling costs due to rising temperatures</li><li>• Higher construction costs for building infrastructure designed to withstand higher sea levels.</li></ul>

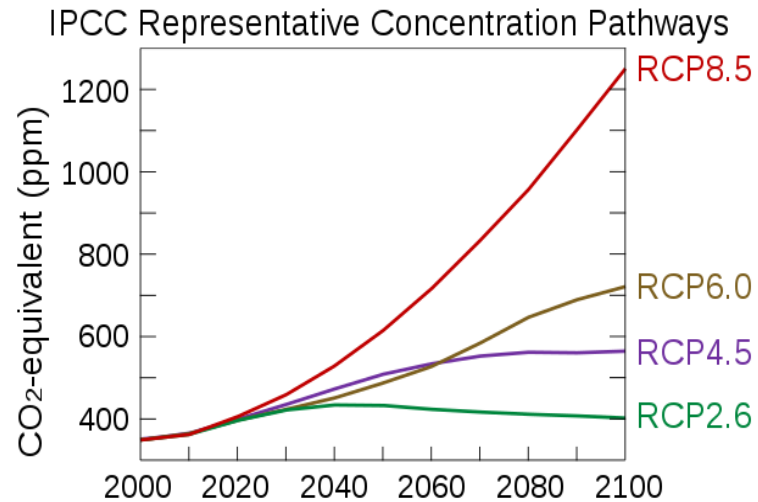
# Transition Risk is Created by Shifting to a Low-Carbon Economy

Policy and Legal	Technology	Market	Reputational
<ul style="list-style-type: none"> <li>Existing or emerging regulation to introduce climate mitigation or adaptation policies.</li> <li>Climate related legal action.</li> </ul>	<ul style="list-style-type: none"> <li>Emerging technologies that support transition to a lower carbon economy.</li> <li>Creates winners and losers.</li> </ul>	<ul style="list-style-type: none"> <li>Changing supply and demand dynamics for commodities.</li> <li>Adjustment in pricing of products and services.</li> </ul>	<ul style="list-style-type: none"> <li>Shifting public sentiment about climate change reduces consumer demand and damages brand value.</li> </ul>
<ul style="list-style-type: none"> <li>Implementation of carbon pricing mechanism to reduce greenhouse gas emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Higher or unexpected research and development expenditures in new technologies to reduce carbon emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Consumer behavior changes due to greater awareness of environmental impacts.</li> <li>Higher input prices and cost of output processing create lower economic return on business.</li> </ul>	<ul style="list-style-type: none"> <li>Investor activism or divestures reducing access to capital markets for fossil fuel-based companies.</li> <li>High carbon emission sectors stigmatized by changes in consumer preferences.</li> </ul>

Source: <https://www.fsb-tcfd.org/publications/final-recommendations-report/>

# Assessing Climate Change Impact on Credit Risk

- Define scenarios – IPCC RCP Scenarios are one tool



- Estimate economic and financial impact of climate change
- Translate financial impacts to credit risk measures



# Financial Implications Will Vary Across Industries

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## □ Direct

- Disruption in operations due to facility damage. (physical location)
- Higher carbon prices or investment costs in new technology. (transition impact)
- Write-off or re-valuation of stranded-assets (transition impact)
- Revaluation of firm due to stranded business plans or strategic shift (transition impact)

## □ Indirect

- Lower productivity due to supply chain disruptions (physical location)
- Reduction in consumer demand for products or services (transition impact)

## □ Macroeconomic

- Changes in capital/labor productivity, in input prices or aggregate consumer demand (physical and transition impact)

# Challenges in Estimating Credit Risk Impact of Climate Change

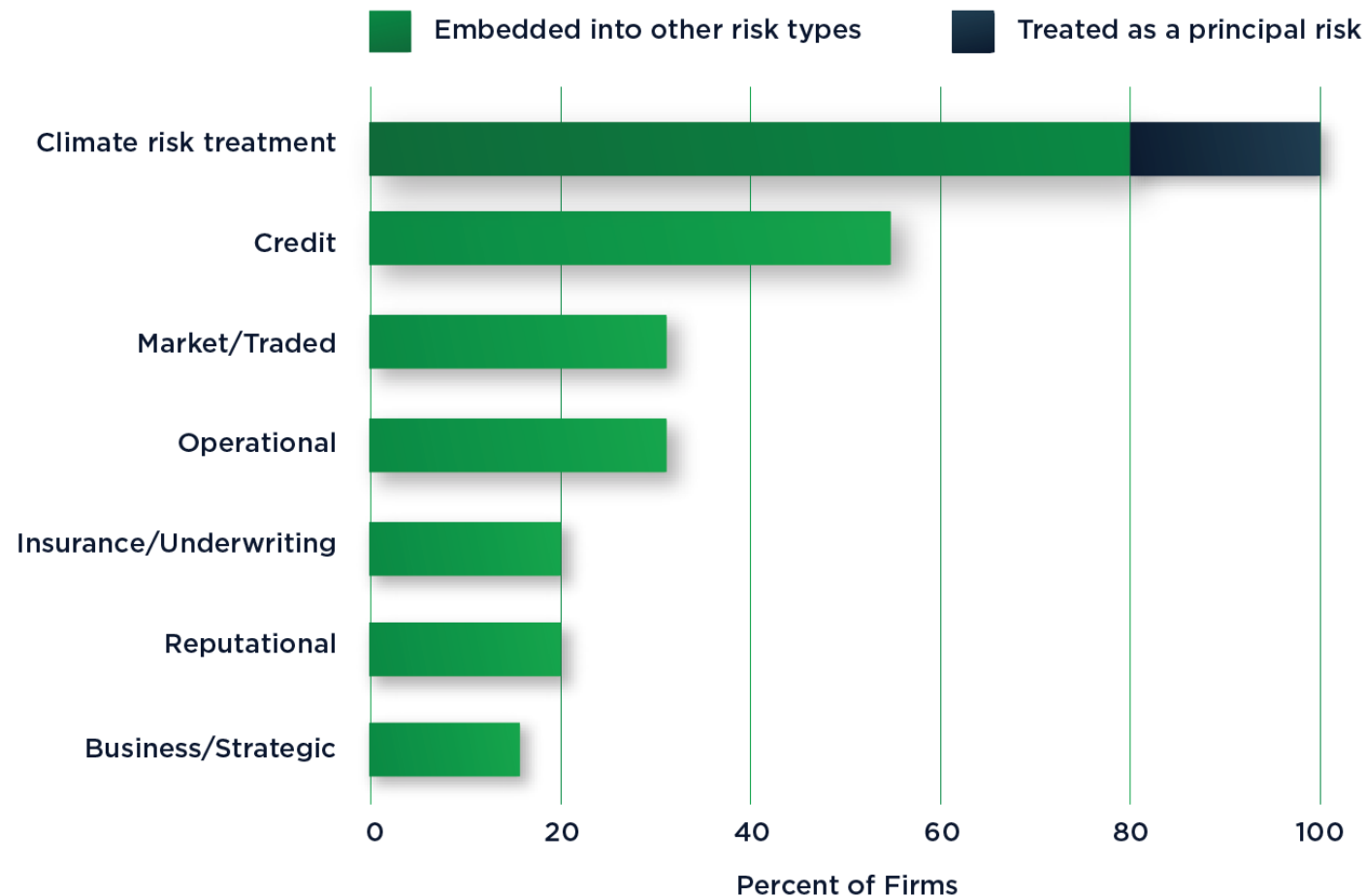
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- Limitations of Historical Data
- Mismatch in Traditional Credit Assessment Time Horizon
- Data Granularity
- Identifying Relevant Risk Measures

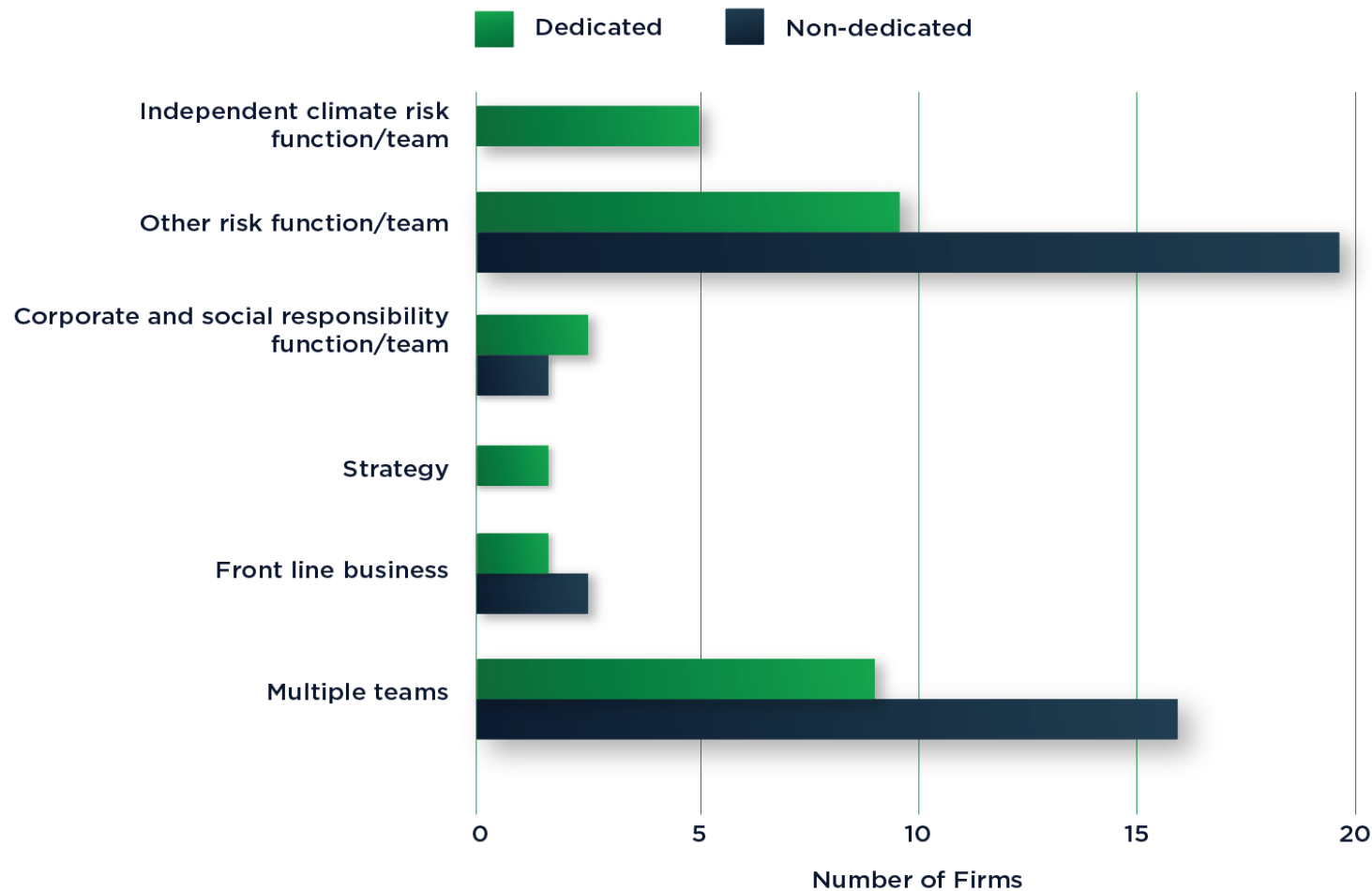
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# Climate Risk is Transverse - Embedded in Established Risk Types

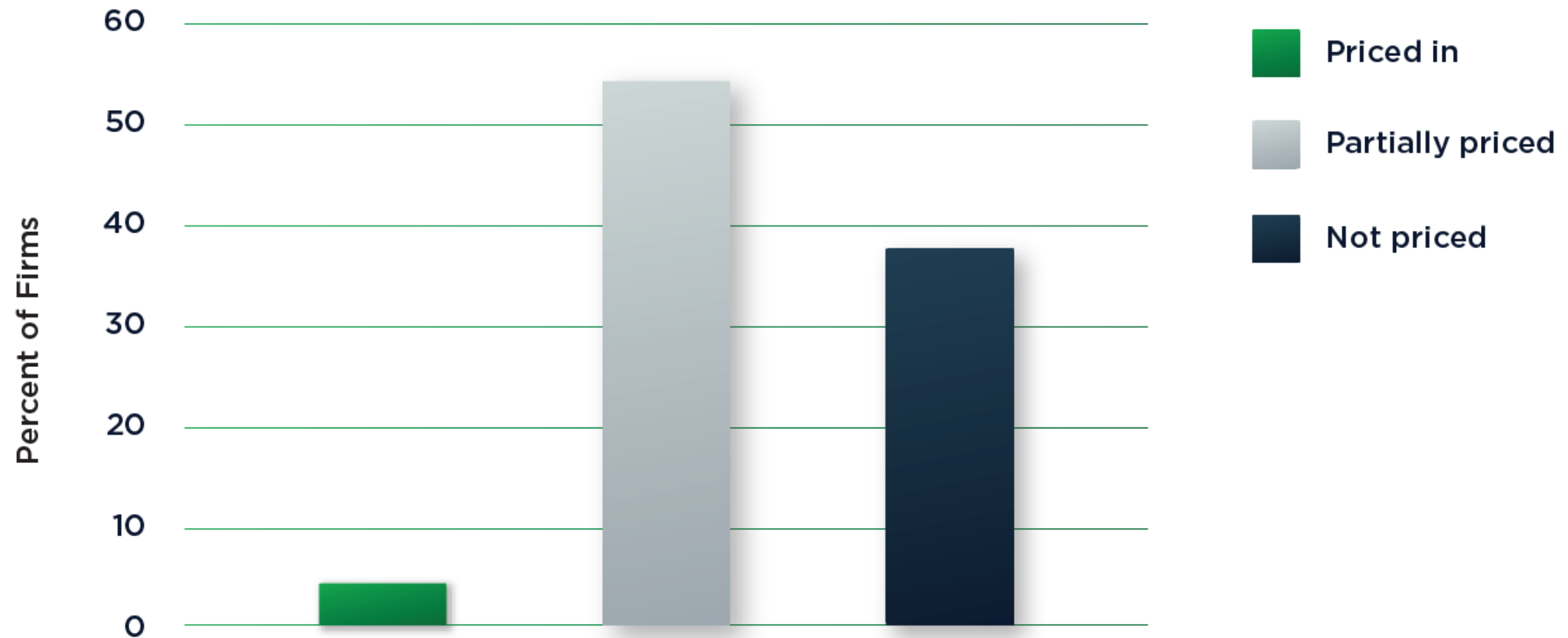


# Risk Teams Most Commonly Manage Climate Risk

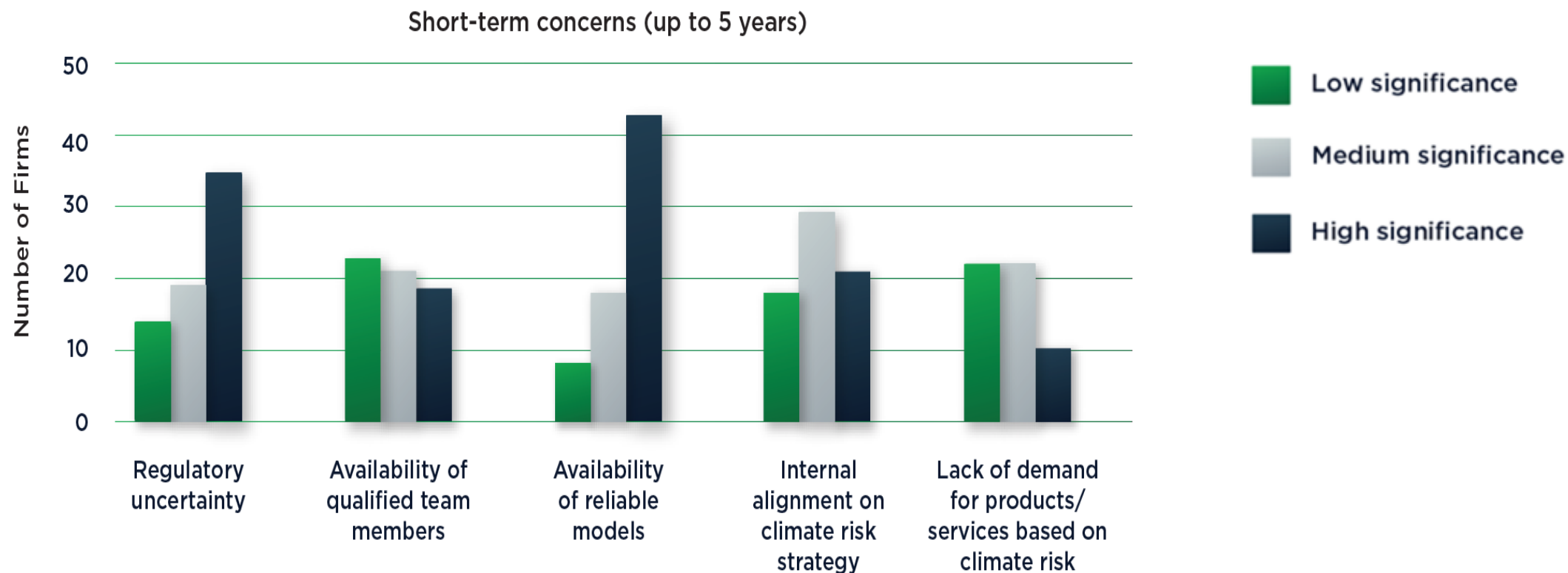




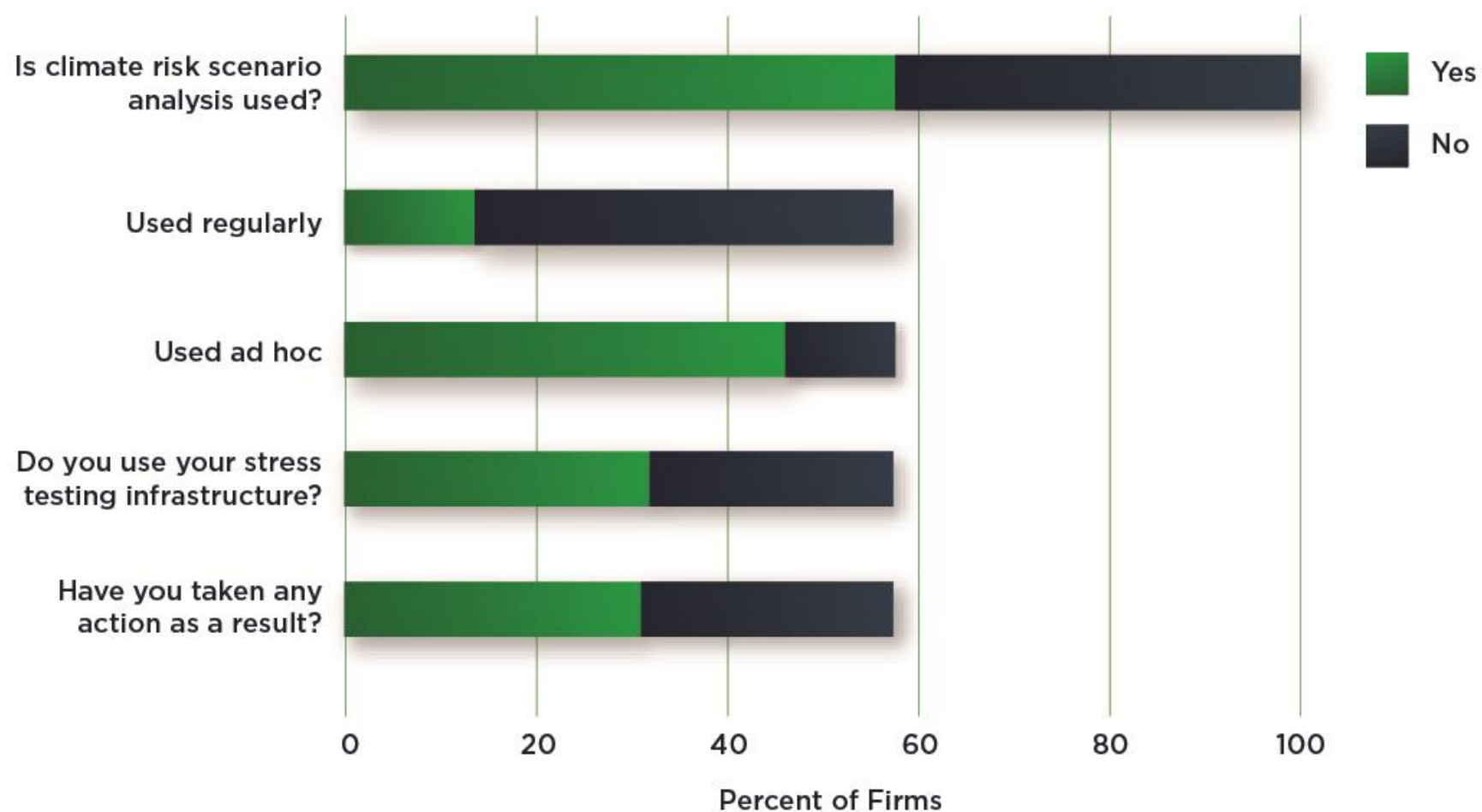
# Climate Risk is not Currently Being Priced



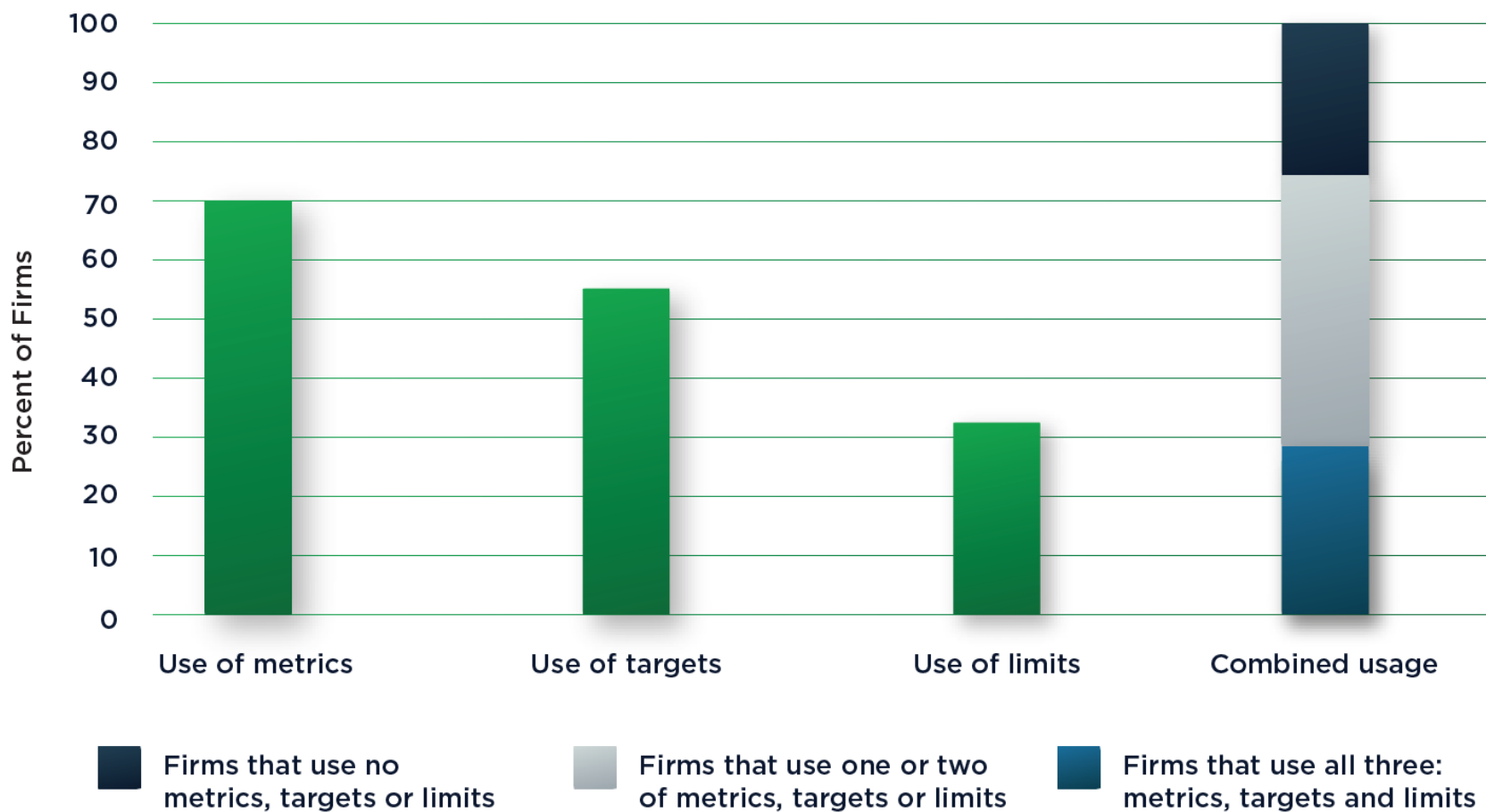
# Lack of Price Transparency is Compounded by other Concerns



# Scenario Analysis is Critical, but Hard



# How to Develop and Implement Metrics, Targets and Limits?



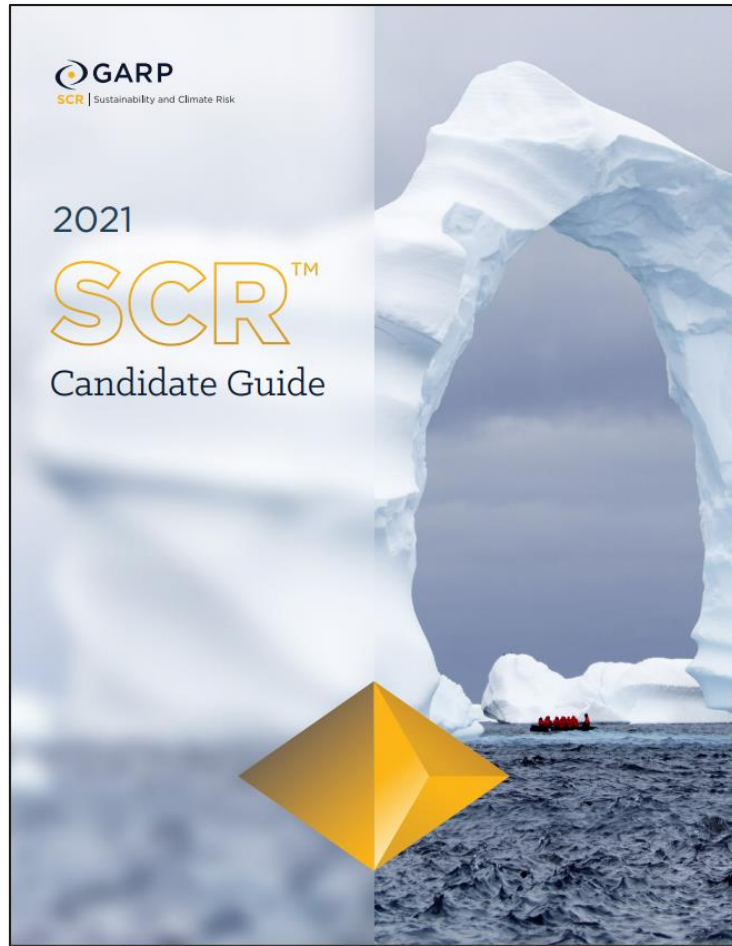
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# Risk Education



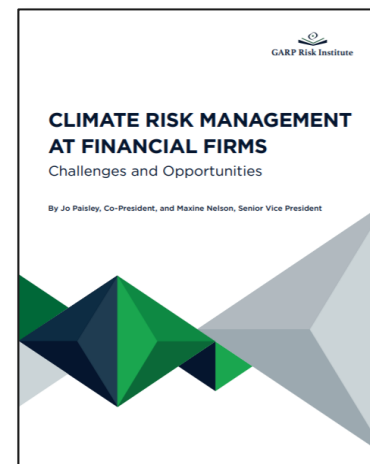
- As the leading professional association for risk managers, GARP developed the SCR program to prepare candidates for sustainability and climate risk challenges.
- Sustainability and Climate Risk (SCR™) Certificate covers:
  - Foundations of Climate Change
  - Policy, Regulations and Implications
  - Green and Sustainable Finance
  - Climate Risk Measurement and Management
  - Climate Scenario Analysis
  - Current Issues in Sustainability and Climate Risk

# GARP's Climate Risk Resources and Activities

## Formal Education



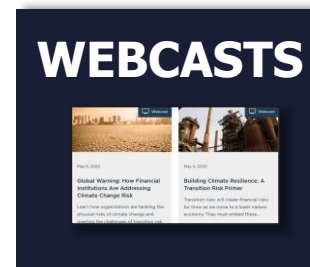
## Research/Papers



## Events



## Multi Media



## Collaborations

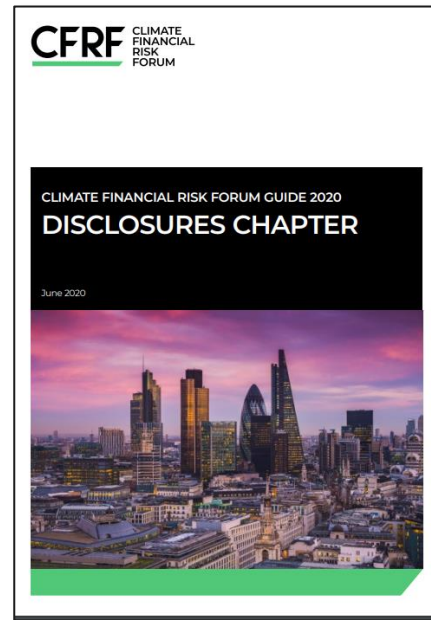
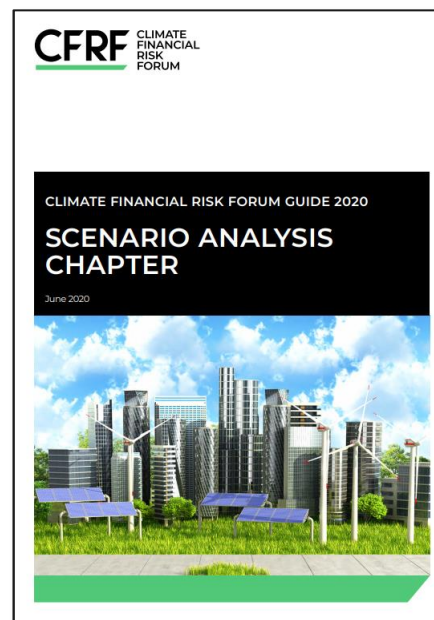
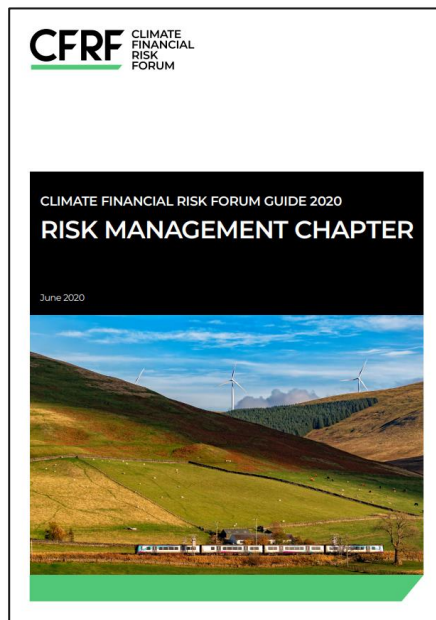


TCFD Knowledge Hub  
Find the resources you need to understand and implement the TCFD recommendations.

For more details visit our "Shifting Landscapes" site at [climate.garp.org](https://climate.garp.org)

# Climate Financial Risk Forum publications

- Further useful information has been published by the Climate Financial Risk Forum - an industry forum set up by UK's PRA and FCA to build capacity and share best practice.
- GARP acted as secretariat for the Risk Management and Scenario Analysis Working groups
- CFRF guide and chapters written by industry, for industry.





# Two Case Studies to Discuss With Your Teams



Transportation



Agriculture

- What are the physical and transition risks?
- What are the financial impacts?

# Case Study – Transportation Industry

□ The transport sector faces numerous transition risks, including:

- Policy and legal risk from stricter targets for emissions and policies that require increased fuel efficiency
- Technology risk due to new low emissions technology
- Market risk from new market entrants with vehicles that are cheaper to buy and operate

□ This can lead to a weakened corporate market position due to lower revenues, higher costs and lower profits.

□ **Examples of potential financial impact are shown in the table below:**

Financial Impact	Risk Factors
Revenue	Revenues could increase by adopting new, more cost-effective, low-carbon products.
Expenditure	Transport companies may need to invest in low-carbon technology to meet future emissions standards.
Assets	Carbon-intensive assets may lose value as the cost of more efficient, low-carbon alternatives declines.

Source: <https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf>



# Case Study – Agriculture Industry

□ The agriculture industry is also exposed to numerous risks, such as:

- Chronic physical risk from changes to growing seasons, rising sea levels and more severe weather interrupt supply chains
- Acute/chronic physical risk from greater water scarcity impacts operations and suppliers
- Transition risk can also reduce industry demand as consumers understand the impact of climate of their food choices.

□ **Examples of potential financial impact are shown in the table below:**

Financial Impact	Risk Factors
Revenue	<ul style="list-style-type: none"><li>• Products that enable adaptation to water scarcity or rising energy costs can increase revenue</li><li>• Sustainable agricultural practices can maintain revenue over time</li></ul>
Expenditure	<ul style="list-style-type: none"><li>• Water scarcity can increase costs and limit production capacity</li></ul>
Assets	<ul style="list-style-type: none"><li>• Assets affected by rising sea levels or severe weather events can be devalued due production disruptions</li></ul>

Source: [https://www.bsr.org/reports/BSR\\_Climate\\_Adaptation\\_Issue\\_Brief\\_Food\\_Bev\\_Ag2.pdf](https://www.bsr.org/reports/BSR_Climate_Adaptation_Issue_Brief_Food_Bev_Ag2.pdf)

# Q&A



# Thank You for Attending Today's Session!

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**About GARP** | The Global Association of Risk Professionals is a non-partisan, not-for-profit membership organization. GARP offers risk certification — the Financial Risk Manager and Energy Risk Professional — and educational programs for professionals at financial institutions, government agencies, central banks, academia and corporations. Through the GARP Benchmarking Initiative and GARP Risk Institute, GARP sponsors research in risk management and promotes collaboration among practitioners, academics and regulators to promote a culture of risk awareness.

Founded in 1996, governed by a Board of Trustees, GARP is headquartered in Jersey City, NJ, with offices in London, Washington, D.C., Beijing and Hong Kong.

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