Preparing for Climate Week NYC?

Read this to sound smart.

Climate Week NYC's packed agenda will cover some of the biggest questions confronting companies and their lenders, insurers and investors.

From the costs of carbon and physical risk to financial performance of solutions providers, and from the retreat of insurance to the costs of environmental destruction, we've got you covered with this pre-read from the frontiers of climate finance research.

Need some quick stats for context? Here's your cheat sheet.

At the MSCI Institute, we'll be doing a deeper dive on these topics on Monday, September 21, bringing leading academics into conversation with the largest investors to jointly examine what the latest evidence implies for action on corporate carbon emissions, adaptation and resilience, the role of insurance and the fragility of ecosystems.

Join the conversation at Climate Week NYC.

Register your interest →

MSCI Institute

1 What is the cost of corporate emissions?

The number of times U.S.-listed companies had to trigger an off-cycle revenue disclosure due to weather-related events has increased sixfold over the past 20 years, according to First Street analysis. What does the evidence tell us about the cost of greenhouse gas (GHG) emissions that fuel global warming in the first place?

Lubos Pastor
Charles P. McQuaid Distinguished Service Professor of Finance at the University of Chicago Booth School of Business

At our forum, we'll anchor the conversation in a presentation by Lubos Pastor, **a professor of finance at the University of Chicago Booth School of Business,** whose research aims to quantify the damages from corporate GHG emissions. To measure that externality, he and his co-authors use a concept they call ***"the carbon burden,"*** which they define as the present value of the social costs associated with companies' future GHG emissions across all emissions scopes. They estimate the U.S. carbon burden to be USD 87 trillion, as of the end of 2023, or roughly 1.3 times the then-market value of U.S. companies. ***The carbon burdens of more than three-quarters (77%) of U.S.-listed firms exceeded their market value.***

As the data suggests, there's real money at stake. The researchers estimate that cutting corporate GHG emissions could reduce the carbon burden by anywhere from 21 to 32%, depending on companies' emissions trajectories after 2030, or as much as USD 29 trillion. Actual corporate emissions reductions, they note, are likely to be smaller, citing MSCI data projecting the emissions trajectories of listed companies in every industry.

Read the research:

"Carbon Burden," Lubos Pastor, Robert F. Stambaugh and Lucian A. Taylor, June 2026.

More context, by the numbers

USD 1.3 trillion

Potential cost to companies globally of asset damage and lost revenue from physical climate risk over the past year. (Source: MSCI)

6.5x

Increase in the likelihood of companies issuing profit warnings following extreme weather events between 2020 and 2023 compared with 2001 to 2004. (Source: First Street)

2x

Amount of clean-energy investment compared with investment in fossil fuels. Around $2.2 trillion is expected to go to grids, storage, low-emissions fuels, nuclear, renewables, efficiency and electrification this year, while around $1.2 trillion is set to be invested in oil, natural gas and coal. (Source: IEA)

2 How have providers of climate solutions performed financially?

Technologies such as battery storage are becoming dramatically more affordable and the conversation about resilience is shifting from downside protection to commercial opportunity for the companies selling these solutions. **But how have these providers of climate solutions performed financially?**

The answer is nuanced, as research by Shirley Lu, **an assistant professor of business administration at Harvard Business School**, and her co-authors shows. Over the roughly 18 years ended in 2023:

Shirley Lu
Assistant Professor of Business Administration, Harvard Business School

- U.S.-listed companies whose filings reference climate solutions (defined as products and services that develop or deploy technologies in a transition to a low-carbon economy) are associated with ***higher revenue growth*** (especially in industries in which innovation is protected by patents).
- Companies with greater exposure to climate solutions traded at ***higher valuations***, suggesting that investors were willing to pay a premium for them.
- At the same time, an investor who bought companies with high exposure to climate solutions while selling short companies with low exposure in the same industry would have ***forgone an average of 5.4% a year in excess returns***.

Why might investors accept lower returns for owning shares of climate-solutions providers? One reason may be that such companies offer a hedge against the risk that comes with the clean-energy transition, Lu suggests. Climate-solutions providers tended to ***outperform following political and regulatory developments*** and international agreements that signaled greater future demand for climate solutions. Their profitability also tended to improve in periods of environmental regulatory uncertainty. In short, investors may value climate-solutions companies partly for their potential to benefit as the transition to a low-carbon economy accelerates.

Read the research:

"**Climate Solutions, Transition Risk, and Stock Returns**," Shirley Lu, Eddie Riedl, Simon Xu and George Serafeim, November 2024.
"**Tracking business opportunities for climate solutions using AI in regulated accounting reports**," Shirley Lu, George Serafeim, Simon Xu and Marc Antonio Awada, November 2025.

More context, by the numbers

-93%

The fall in battery costs since 2010, making alternatives in power generation and transport more economic without policy support. (Source: MSCI)

30%

The share of global car sales expected this year for electric vehicles and plug-in hybrids, as the Middle East war and falling battery costs boost demand. (Source: IEA)

65%

Average monthly gross stock returns of listed companies with revenue from adaptation and resilience solutions over the 29 months ended May 31, 2026, compared with 59% for non-providers. (Source: MSCI Institute)

3 Who bears the risk when insurers retreat?

As extreme weather events intensify, the share of economic losses not covered by insurance continues to grow. ***The insurance protection gap,*** as it's known, averaged roughly USD 64 billion annually in the U.S. between 2021 and 2024 and USD 68 billion in the European Union over the three years ended 2023. A combination of rising hazard activity and growing exposure can make it more difficult for insurers to maintain coverage.

Ishita Sen
Assistant Professor of Finance, Harvard Business School

Ishita Sen, an assistant professor of finance at Harvard Business School, has examined the forces that may be widening that gap. She and her co-authors have highlighted, for example, the role of lenders in determining how much insurance U.S. homeowners buy. Lender requirements increase homeowners' coverage, but because those requirements are designed to protect the lender, ***homeowners can still be left exposed to losses*** — especially as premiums rise and they cut back on coverage beyond the lender-required amount.

Lenders may also benefit from the way the U.S. federal mortgage-finance agencies price insurance risk, according to Sen. Her research shows that Fannie Mae and Freddie Mac treat loans backed by insurers at greater risk of insolvency as safer than the evidence suggests they are — without charging enough for the difference. The result: lenders can make mortgages they might otherwise reject and transfer the underpriced risk to the government, ***exposing taxpayers to potential losses***.

Read the research:

"The Insurance Protection Gap," Parinitha Sastry, Therese C. Scharlemann, Ishita Sen and Ana-Maria Tenekedjieva, May 2024.

"When Insurers Exit: Climate Losses, Fragile Insurers, and Mortgage Markets," Parinitha Sastry, Ishita Sen and Ana-Maria Tenekedjieva, February 2024.

More context, by the numbers

1.4%

The nonrenewal rate for property insurance in U.S. counties most exposed to physical climate risk in 2023, double the rate in 2018. (Source: MSCI Institute)

88%

Share of insurers and reinsurers surveyed globally who say that physical climate risk could become systemic financial risk. (Source: MSCI Institute)

33%

Share of North American insurers surveyed who say they've integrated physical climate risk into overall risk management. (Source: MSCI Institute)

4 Can we put a price on environmental destruction?

Roughly three-quarters of terrestrial ecosystems and two-thirds of marine ecosystems have been significantly altered or degraded by human activities, according to IPBES, the biodiversity-focused intergovernmental science-policy body. But while investors are increasingly aware that nature and biodiversity loss pose financially significant risks, measuring and pricing them remains a challenge.

Johannes Stroebel
David S. Loeb Professor of Finance at the New York University Stern School of Business

Johannes Stroebel**, a professor of finance at New York University's Stern School of Business**, will share evidence from his research with Stefano Giglio, Theresa Kuchler and Olivier Wang into the vulnerability to further biodiversity loss of services that nature provides to the economy. The researchers draw a parallel with climate risk, finding that companies can face both physical risk because they depend on ecosystem services such as water, pollination or healthy soils, and transition risk because companies that damage nature may face future regulation or other costs. Research reviewed by the authors finds that companies with greater physical biodiversity exposure have tended to **perform worse following negative biodiversity news**, while companies with larger negative impacts on biodiversity have **lost value following important policy developments.**

Read the research:

"The Economics of Biodiversity Loss," Stefano Giglio, Theresa Kuchler, Johannes Stroebel and Olivier Wang, July 2024

"Nature and Biodiversity Loss: A Research Agenda for Financial Economics," Stefano Giglio, Theresa Kuchler, Johannes Stroebel and Olivier Wang, September 2025

More context, by the numbers

70%

Share of financial practitioners, academics and regulators surveyed who say physical and transition biodiversity risks are at least moderately material for U.S. companies. (Source: Johannes Stroebel et al.)

22

Number of the Kunming-Montreal Global Biodiversity Framework's 23 targets for 2030 that countries are currently on track to miss. (Source: UN Convention on Biological Diversity)

75%

Share of Earth's surface that has been altered by human activity. (Source: IPBES)

Stay on the frontiers of climate finance research

Peter Tufano
Baker Foundation Professor at Harvard Business School and Senior Advisor to the Harvard Salata Institute for Climate and Sustainability

Peter Tufano, **Baker Foundation Professor at Harvard Business School,** will open our forum with an overview of the climate-finance research landscape.

He also co-edits **SSRN's Climate Finance eJournal,** sponsored by the MSCI Institute, with Laura Starks**, professor of finance at the University of Texas at Austin.** The eJournal curates the latest academic research from across the field.

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