

CONSTRUCTING A FEASIBLE APPROACH TO ESTIMATING CLIMATE-RELATED CREDIT RISK

BY NOW, INCLUDING CLIMATE CHANGE WITHIN BANKS' RISK ANALYSIS IS ACKNOWLEDGED AS AN INDUSTRY NEED. FIRST, THOUGH, BANKS NEED TO DETERMINE EXACTLY WHAT IS BEING CALCULATED, AND SECOND, HOW TO INTEGRATE THE RESULTS.

Climate Risk Perspectives

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Climate change creates risks across multiple dimensions...

Climate change will cost businesses, and therefore corporate borrowers, within the real economy, significant amounts of their free cash flow. This cost will arise from:

Transition Risk - This is the risk of costs of compliance with local policy that impacts the borrowing firm. This comes from:

- › Direct costs of compliance for target industries and firms
- › Indirect costs within their up and downstream supply chains

Physical Risk - This is the risk of costly damage due to physical climate change.

This comes from:

- › Adaptations to avoid physical impacts
- › Insurance costs against physical impacts

The net effect is that the financial profile changes, and therefore the credit profile changes. This implies that there is a potential risk in loans that is not being paid for via a basis point spread or that capitalizing the risk in the form of economic capital is more costly as it is insufficiently funded.

Building a project to estimate risk-based costs...

Any framework that aims to put 'hard' numbers against climate change risk must be multi-dimensional in its ambition. This can only be achieved by running climate pathways in the form of economic scenarios against the loan book, including:

Scenarios covering at least

- › Current policy pathways - assumes full implementation of current policies on statute books
- › NDCs or Nationally Determined Contributions - assumes full implementation of policies to meet 'soft' commitments to the UN's COP under the Paris accord
- › 2 degrees - assumes implementation of pathway policies that would be required to hold global warming to 2 degrees above pre-industrial levels
- › 2 degrees delayed - the same as above but with a delayed start

Per scenario, loan and, aggregation to balance sheet level

- › Unexpected risk capital level
- › Expected risk capital level
- › Implied change in default probability
- › Implied basis point spread per loan

These outputs provide the risk committee with the means to determine the overall climate-specific credit risk that needs to be included as every country across the world is impacted by the transition to, and the physical consequences of, a greener economic paradigm.

Specific data is needed to run climate scenarios...

The required outputs for any climate-based risk assessment must include:

Loan details, including

- › Geography
- › Industry
- › Current rating
- › Adaptations already in place

Scenario data

- › Target industries for transition
- › Industry-level adaptations/regulations
- › Supply chain impacts from transition
- › Costs associated with transition and physical climate change

Loan Details

Core loan systems should hold basic details of the loans themselves. Specific data on business model adaptations must also be kept in order to assess how far along the sustainable journey each obligor has gone. This information has a material impact on the extent to which new regulations will impact the profitability and resultant credit profile.

The geographic location and jurisdiction of a corporate borrower is of paramount importance in assessing both its exposure to climate policy (transition risk) and climate events (physical risk). Without a policy in place to actively force a change to the business model/costs, there is little incentive for a firm to invest in adaptations to reduce its impact on the environment. Similarly, each industry has either its own set of climate adaptations or is associated with one that does, via its place in the overall supply chain. Examples of adaptations by industry can be found in reports such as the World Economic Forum's 'Net-Zero Tracker' [report](#).



Source: www3.weforum.org

The current rating of the obligor is also required data. Ratings are, at least in part, reflections of the free cash flow that covers the expense of covering current debts and outgoings. Expenses related to transitional adaptations must be seen as additional costs to continue in business and, therefore, directly reduce such coverage. Before and after applying climate pathway scenarios, the overall credit profile must take all of the above into consideration.

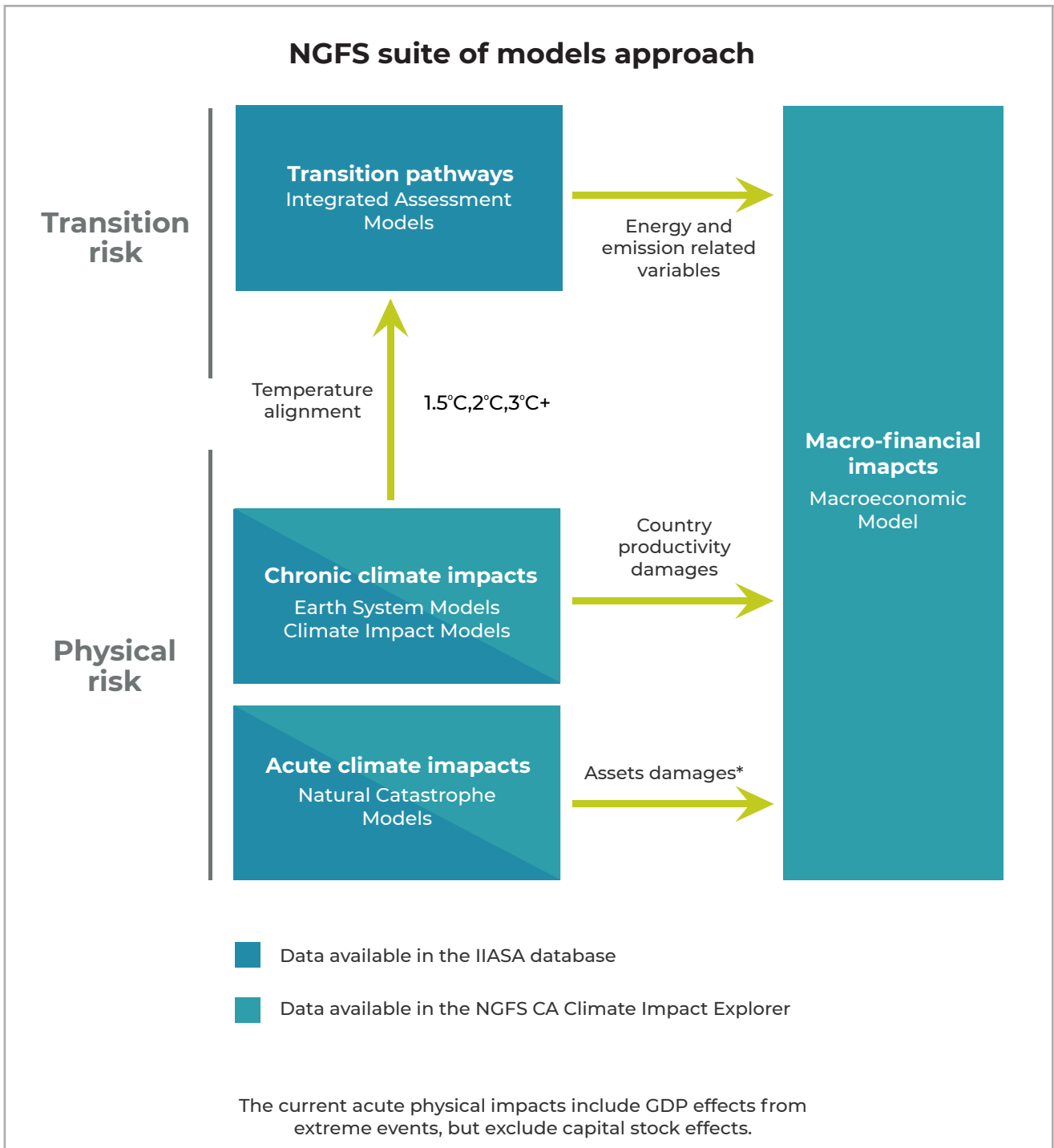
Scenario data

Climate pathways are complex and written as 'real world' adaptations that must be made across areas such as:

- › Buildings
- › Industry
- › Agriculture
- › Infrastructure
- › Transportation
- › Tourism

While the Intergovernmental Panel on Climate Change (IPCC) has produced high-level pathways that would result in average global warming increases (relative to pre-industrial levels) of various levels, the majority of countries have also submitted at least an initial NDC. These need to be scrutinized and used as the basis for aspirational targets for each, juxtaposed with policies currently in place in each region.

- › NDCs are constantly updated by the UN and can be accessed [here](#)
- › Current policies are generally detailed on each government website
- › Costs associated with the transition and implied physical damage are broken down by country and region on the [NGFS site](#)



Once this data is sourced, bank analysts must look beyond specifically targeted industries into their supply chains in order to create a more complete picture. There are a number of options available to climate teams in this area, including looking at idiosyncratic stock market returns by sector and correlating these to the core target sectors. This provides reasonable insight into the overall supply chain impacts.

Bringing the data together...

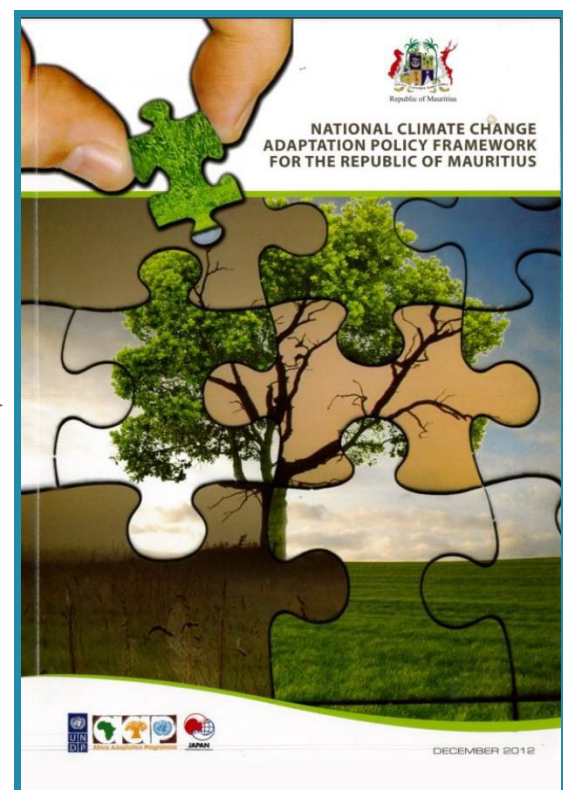
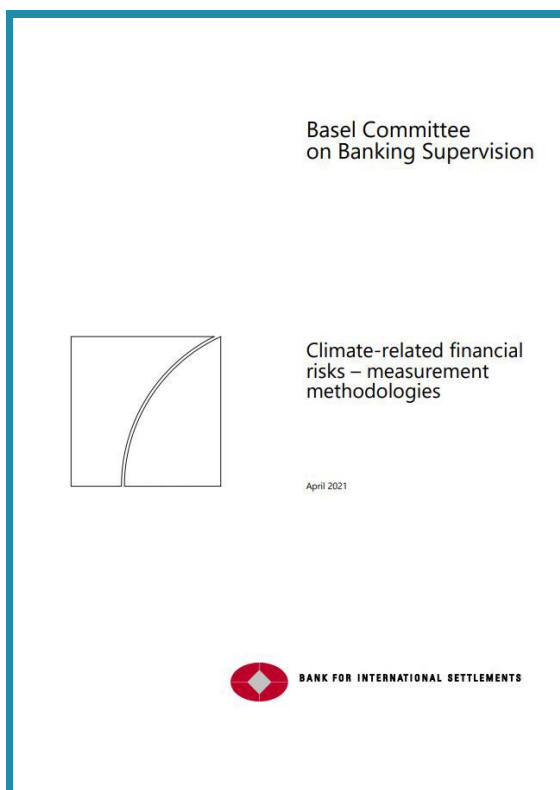
Banks are ultimately concerned with credit, market and liquidity risks arising from climate change. The most pressing category, though, is credit risk. Trillions of dollars are needed per annum to meet the wider investment goals of the 2-degree targets, and banks must ensure that they are in a position to act as the funding conduit for that monetary flow. The most significant threat to that positioning is a sudden increase in default likelihood, coming from borrowers using more of their revenue in meeting new regulations, leaving themselves less able to service their debts properly.

With this in mind, the following calculations are required per scenario, loan and aggregation to balance sheet level:

- › Unexpected risk capital level
- › Expected risk capital level
- › Implied change in default probability
- › Implied basis point spread per loan

This is explicitly recognized by the Basel Committee on Banking Supervision (BCBS), as is illustrated in its 2021 review of considerations and methodologies for measuring [climate-related financial risks](#).

From best practice to policy...



This analysis is being picked up by central bankers in countries such as Mauritius, where, [guidance](#) to its banks was issued in April of 2022, and action plans for bringing climate change into their core risk analysis are now a requirement.

An important aspect of the Mauritius guidance is that it expects climate change to sit within but be clearly differentiated from banks' standard risk management. Three lines of defense are explicitly mentioned, and analysis must include:

“Financial institutions shall have a framework for measuring and monitoring material, climate-related and environmental financial risks, which as a minimum, will:

- i. include the development of relevant risk indicators to categorize counterparties, sectors, and geographical locations based on the extent of climate-related and environmental financial risks;*
- ii. comprise an adequate risk monitoring process, which includes usage of qualitative and quantitative analytic tools and metrics to monitor relevant risk indicators and climate-related and environmental financial risk exposures against the overall strategy and risk appetite for climate-related and environmental financial risks and to support decision making;*
- iii. ensure that the risk appetite framework incorporates relevant risk exposure limits and thresholds for the risks and;*
- iv. encompass measures to encourage counterparties to provide relevant disclosures on climate-related and environmental financial risks.”*

A win-win situation...

Banks that implement a system of risk management that clearly identify climate risks, quantifying the extent to which financial resiliency is at risk, will not only put themselves in a position to benefit from the transition to a greener economy, but also place themselves ahead of the regulatory wave that will, in short order, require them to do so.

GreenCap can help...

GreenCap is a Risk as a Service (RaaS) solution that enables banks to:

- Identify financial risks arising from climate change

- Measure
 - › Increases in default probability per loan per scenario
 - › Changes in economic capital that can be expected at loan and balance sheet level, per scenario
 - › Re-price loans in basis point terms to ensure that green businesses are incentivized while non-green credits are charged appropriately
- Report risks by stress test and climate pathway to
 - › Management
 - › Stakeholders
 - › Regulators



Visit [GreenCap.live](https://www.greencap.live) for further news, insights, and resources curated for banks to bring climate change into their risk management, as well as details about the GreenCap climate risk system.



ABOUT GREENCAP

- › GREENCAP is a turnkey 'Risk as a Service' (RaaS) solution, designed for banks to include climate change as a category in their risk management frameworks.
- › The solution allows banks to replicate climate pathways within their scenarios for economic impact and risk analysis.
- › Using GreenCap, banks can modify pathways and scenarios to include the timing effects of delayed sustainability transition measures.
- › Loans and credit facilities are measured and monitored against risks arising from both 'physical' and 'transition' impacts.
- › GreenCap provides support for risk reporting and governance in the areas of 'Responsible Banking' and climate change.
- › With GreenCap, banks can ensure that their climate strategies are financially grounded, and loan pricing is optimized throughout the transition to a green global economy.



ABOUT GREENPOINT FINANCIAL

- › GreenPoint Financial is a division of GreenPoint Global, which provides software-enabled services, content, process and technology services, to financial institutions and related industry segments.
- › GreenPoint is partnering with Finastra across multiple technology and services platforms.
- › Founded in 2006, GreenPoint has grown to over 500 employees with a global footprint. Our production and management teams are in the US, India, and Israel with access to subject matter experts.
- › GreenPoint has a stable client base that ranges from small and medium-sized organizations to Fortune 1000 companies worldwide. We serve our clients through our deep resource pool of subject matter experts and process specialists across several domains.
- › As an ISO certified by TÜV Nord, GreenPoint rigorously complies with ISO 9001:2015, ISO 27001:2013, and ISO 27701:2019 standards.



Marcus Cree

MANAGING DIRECTOR AND
HEAD OF FINANCIAL TECHNOLOGY AND SERVICES

Marcus has spent 25 years in financial risk management, working on both the buy and sell side of the industry. He has also worked on risk management projects in over 50 countries, gaining a unique perspective on the nuances and differences across regulatory regimes around the world.

As Managing Director, Marcus heads GreenPoint Financial Technology and Services and has been central in the initial design of GreenPoint products in the loan book risk area, including CECL and sustainability risk. This follows his extensive experience in the Finastra Risk Practice and as US Head of Risk Solutions for FIS. Marcus has also been a prolific conference speaker and writer on risk management, principally market, credit and liquidity risk. More recently, he has written and published papers on sustainability and green finance.

Marcus graduated from Leicester University in the UK, after studying Pure Mathematics, Psychology and Astronomy. Since graduation, Marcus has continually gained risk specific qualifications including the FRM (GARP's Financial Risk Manager) and the SCR (GARP's Sustainability and Climate Risk). Marcus's latest academic initiative is creating and teaching a course on Green Finance and Risk Management at NYU Tandon School of Engineering.



Sanjay Sharma, PhD

FOUNDER AND CHAIRMAN

Sanjay provides strategic and tactical guidance to GreenPoint senior management and serves as client ombudsman. His career in the financial services industry spans three decades during which he has held investment banking and C-level risk management positions at Royal Bank of Canada (RBC) Goldman Sachs, Merrill Lynch, Citigroup, Moody's, and Natixis. Sanjay is the author of "Risk Transparency" (Risk Books, 2013), Data Privacy and GDPR Handbook (Wiley, 2019), and co-author of "The Fundamental Review of Trading Book (or FRTB) - Impact and Implementation" (Risk Books, 2018).

Sanjay was the Founding Director of the RBC/Hass Fellowship Program at the University of California at Berkeley and has served as an advisor and a member of the Board of Directors of UPS Capital (a Division of UPS). He has also served on the Global Board of Directors for Professional Risk International Association (PRMIA).

Sanjay holds a PhD in Finance and International Business from New York University and an MBA from the Wharton School of Business and has undergraduate degrees in Physics and Marine Engineering. As well as being a regular speaker at conferences, Sanjay actively teaches postgraduate level courses in business and quantitative finance at EDHEC (NICE, France), Fordham, and Columbia Universities.