

BANKING RISK MANAGEMENT ON THE AFRICAN FRONTLINE OF CLIMATE CHANGE

THERE IS MUCH DISCUSSION ABOUT THE PHYSICAL IMPACTS OF CLIMATE CHANGE ON AFRICA, BUT THE CENTRAL BANKS OF THIS CONTINENT ARE WELL AWARE OF, AND ARE PREPARING REGULATIONS TO DEAL WITH INCREASED CREDIT AND LIQUIDITY RISKS CREATED BY THE PHYSICAL AND TRANSITIONAL ELEMENTS OF GLOBAL WARMING. BANKS IN THE REGION NEED TO PAY CLOSE ATTENTION.

Climate Risk Perspectives

GREEN LIGHTS

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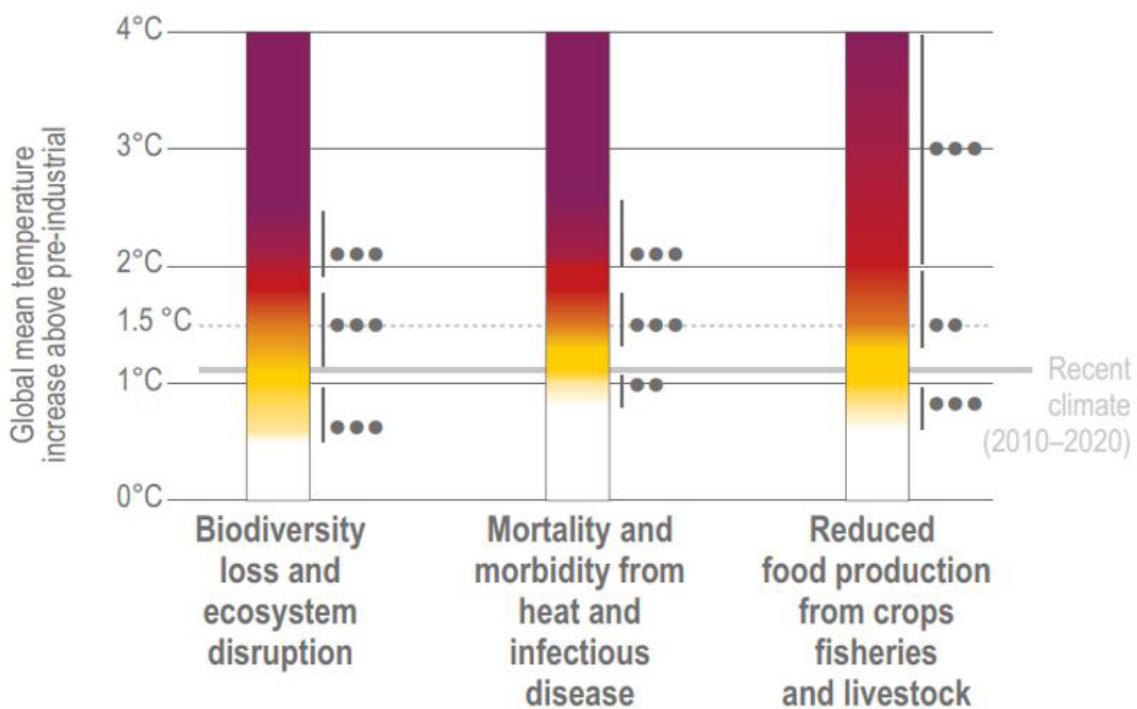
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Africa is disproportionately affected by climate change...

While contributing a negligible amount of CO₂ to the overall atmospheric accumulation, Africa is one of the most highly exposed continents to the impacts of climate change in the world. According to the latest [report](#) by the 'Intergovernmental Panel on Climate Change' (IPCC), the region is expected to experience substantial negative impacts from global warming, even in and around the globally agreed targets of 1.5 and 2 degrees.

Temperature rises of 3 degrees put Africa at 'very high risk' across key sectors.

Key risks for Africa increase with increasing global warming



Level of impact or risk

- Very high
- High
- Moderate
- Undetectable

Confidence level for transition

- Very high
- High
- Medium
- Low

Transition range

The report highlights more details on the sector with specific 'key risks' as follows:

Sector	Loss and damage from climate change
Ecosystems	<ul style="list-style-type: none"> Local, regional and global extinction Reduced ecosystem goods and services Declining natural coastal protection and habitats Altered ecosystem structure and declining ecosystem functioning Nature-based tourism Biodiversity loss
Water	<ul style="list-style-type: none"> Declining lake and river resources Reduced hydroelectricity and irrigation Disappearing glaciers Reduced groundwater recharge and salinisation Drought
Food systems	<ul style="list-style-type: none"> Reduced crop productivity and revenues Increased livestock mortality and price shocks Decreased fodder and pasture availability Reduced fisheries catch and fisher livelihoods
Human settlements and infrastructure	<ul style="list-style-type: none"> Loss or damage to formal and informal dwellings Damage to transport systems Damage to energy systems Water supply, sanitation, education and health infrastructure Migration
Health	<ul style="list-style-type: none"> Loss of life Loss of productivity Reduced nutrition
Economy, poverty and livelihoods	<ul style="list-style-type: none"> Loss of livelihoods, jobs and income Reduced productive land Reduced economic growth and increased inequality Community and involuntary displacement Reduced labour productivity and earning potential Delayed and poorer education progress Reduced tourism Increased urban in-migration
Heritage	<ul style="list-style-type: none"> Loss of traditional cultures and ways of life Loss of language and knowledge systems Damage to heritage sites

With specific vulnerabilities within the following areas:

Key climate change risk	Climate impact driver	Vulnerability
Local or global extinction of species and reduction or irreversible loss of ecosystems and their services, including freshwater, land and ocean ecosystems	Increasing temperatures of freshwaters, ocean and on land; heatwaves; precipitation changes (both increases and decreases); increased atmospheric CO ₂ concentrations; sea level rise; ocean acidification	Vulnerability highest among poorly dispersing organisms (plants) and species with narrow and disappearing niches (e.g., mountain endemics), and is exacerbated by non-climate hazards (e.g., habitat loss for agriculture or afforestation projects); vulnerability is high for Protected Areas surrounded by transformed land preventing species' dispersal and areas with limited elevational gradients that reduce their potential to act as climate refugia.
Risks to marine ecosystem health and to livelihoods in coastal communities	marine heatwaves, increased acidification and sedimentation/ turbidity	low-income coastal communities (e.g., artisanal fisherfolk, fishmongers) whose livelihood depends on healthy coral reefs, seagrass beds and mangroves
Loss of food production from crops, livestock and fisheries	Increasing temperatures and heat waves for freshwaters, ocean and on land; precipitation changes; drought; increased atmospheric CO ₂ concentrations	High for low-income coastal and riparian communities whose livelihood depends on healthy ocean and freshwater ecosystems, and for populations reliant on fish for protein and micronutrients. Vulnerability is high for many food producers dependent on rainfall and temperature conditions, including subsistence farmers, the rural poor, and pastoralists. Lack of access to climate information and services increases vulnerability.
Mortality and morbidity from increased heat and infectious diseases (including vector-borne and diarrhoeal diseases)	Increasing temperatures; heatwaves; precipitation change (both increases and decreases)	Vulnerability is highest for the elderly, pregnant women, individuals with underlying conditions, immune-compromised individuals (e.g., from HIV) and young children. Regions without vector control programmes in place or without detection and treatment regimens.

Key climate change risk	Climate impact driver	Vulnerability
		<p>Inadequate insulation in housing in informal settlements in urban heat islands. Inadequate improvements in public health systems.</p> <p>Inadequate water and sanitation infrastructure, especially in rapidly expanding urban areas and informal settlements.</p>
<p>Reduced economic output and growth, and increased inequality and poverty rates</p>	<p>Increased temperatures; reduced rainfall; drought; extreme weather events</p>	<p>Conditions underlying severe risk are lower income growth, higher population levels, low rates of structural economic change with more of the labour force engaged in agriculture and other more climate-exposed sectors due in part to physical labour outdoors.</p>
<p>Water and energy insecurity due to shortage of irrigation and hydropower</p>	<p>Heat and drought</p>	<p>High reliance on hydropower for national electricity generation, especially east and southern African countries. Planned for high reliance on irrigated food production. Concentrations of hydropower plants within river basins experiencing similar rainfall and runoff patterns. Limited electricity trade between major river basins.</p>
<p>Cascading and compounding risks of loss of life, livelihoods and infrastructure in human settlements</p>	<p>Extreme heat; floods; drought; sea level rise and associated coastal hazards; compound climate hazards (e.g., coinciding heat and drought)</p>	<p>Coastal and low-lying urban areas and those in dryland regions with rapidly growing populations. People living in informal settlements. Increased magnitude of heat waves due to urban heat island effects. Climate shocks to municipal revenues (e.g., from water). Unaffordable maintenance of transport and protective infrastructure with increasing climate impacts. Greater water resource demand from urban and non-urban populations and key economic sectors</p>

A result of already being a relatively low 'Greenhouse Gas' (GHG) and its 'frontline' position against physical climate change, African countries are directing their climate-related commitments and policies as much towards adaptation than mitigation.

53 (of 54) African countries have submitted NDCs to the UN...

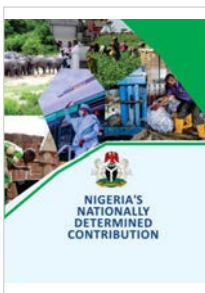
Governments from the continent have submitted 'Nationally Determined Contribution' (NDC) to the UN. These documents were created as a result of the Paris-based 'Conference of the Parties' (COP) 21. This conference was seen as a breakthrough moment in the history of climate change because of the agreements in several specific areas:

- Attendees agreed to limit global warming to 2 degrees above pre-industrial levels.
- Attendees agreed to make best efforts to limit global warming to 1.5 degrees above pre-industrial levels.
- Attendees agreed to create local plans within their own countries that would specify targets and actions to achieve them. These NDCs would then be ratcheted up over time.

The key to success was that the NDCs were separate from overall ambitions. This was a political device that allowed high-level ambitions to be agreed upon before the means of delivering it were decided. There has been, and continues to be, a disagreement between countries as to what constitutes 'fair share' in terms of economic disruption. The nexus of this argument is that Africa has the most to gain from reaching the target heating limits, while it contributes the lowest amount of GHG.

53 of the 54 African countries have submitted their NDC documentation. The breakdown of all NDCs can be accessed at the [African NDC Hub](#). As examples, below are three of them, along with the ambitions, targets and target sectors.

Nigeria



GHG Reduction:

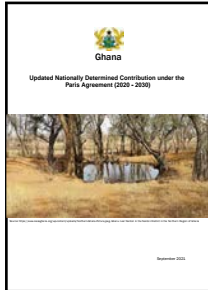
- 20% (unconditional) and 45% (conditional)
- 40% energy efficiency target by 2030
- 2% energy efficiency improvement per year
- End gas flaring by 2030

Targeted Economic Sectors:

- Energy & Efficiency
- Agriculture
- Infrastructure & Housing
- Waste

Adaptation Commitment:

- › Efficiency standards for new cars
- › Housing standards for CC adaptation
- › Climate-smart agriculture and reforestation

Ghana

GHG Reduction:

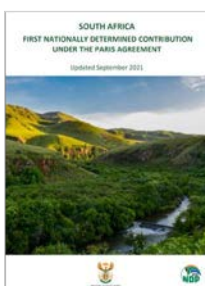
- › 15% below 'Business as Usual' (BAU) (unconditional), and 45% (conditional)
- › Double energy efficiency improvement to 20% in industrial facilities by 2030
- › Scale up access and adoption of 2 million efficient cook stoves up to 2030
- › Scale up renewable energy penetration by 10% by 2030
- › Increase solar lantern replacement in rural non-electrified households to 2 million
- › Double the current waste-to-compost installed capacity of 180,000 tons/annum by 2030

Targeted Sectors:

- › AFOLU
- › Energy
- › IPPU
- › Transport
- › Infrastructure (climate-proofing)
- › Waste

Adaptation Commitment:

- › City resilient infrastructure
- › Solar home systems (incl. lantern)
- › Efficient cook stoves
- › Mass transportation
- › Methane recovery increased to 60% of landfills by 2030 (40% in 2025)
- › Biogas
- › Compost
- › Phase-out of HFCs in AC (green cooling)

South Africa

GHG Reduction:

- › Targeted trajectory - peak, plateau and decline
- › Decarbonized Energy system by 2050

Targeted Sectors:

- › AFOLU
- › IPPU
- › Energy & Efficiency
- › Waste

Adaptation Commitment:

- › Energy-efficient lighting
- › Efficient motors + appliances
- › Solar water heaters
- › Electricity + hybrid vehicles
- › Advanced bioenergy
- › Carbon Capture & Storage
- › Implementing regulatory standards & controls

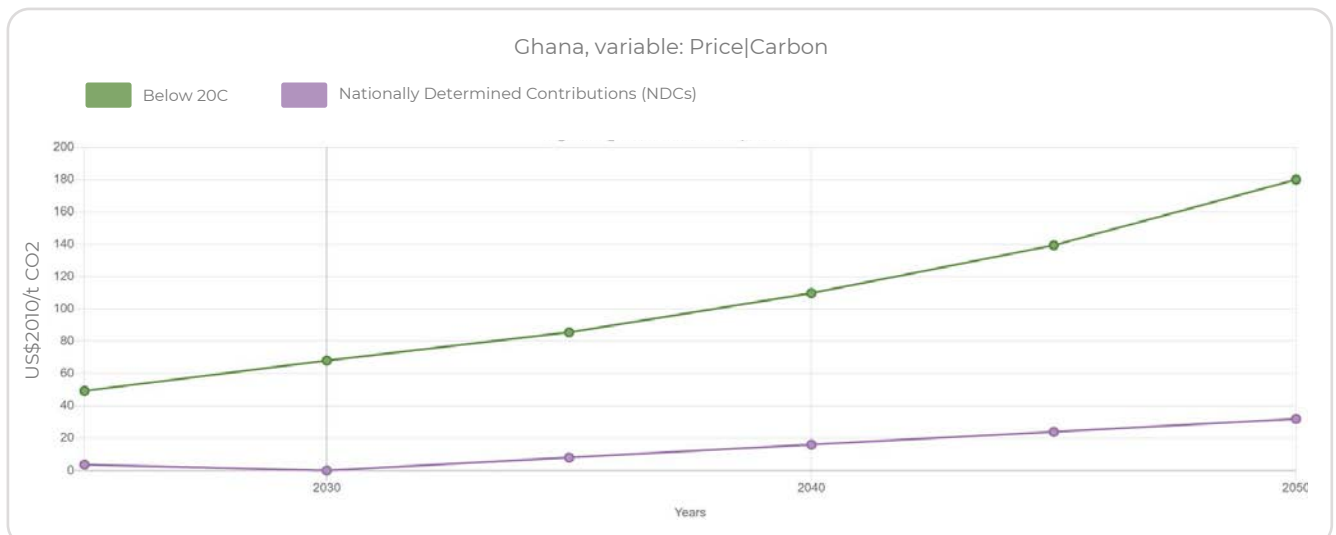
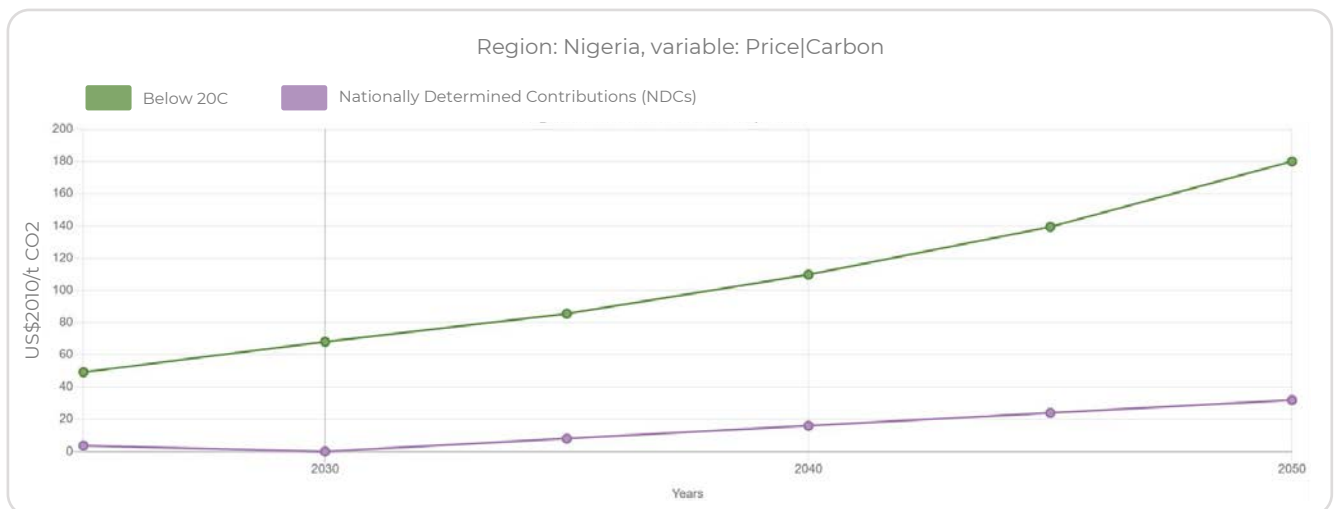
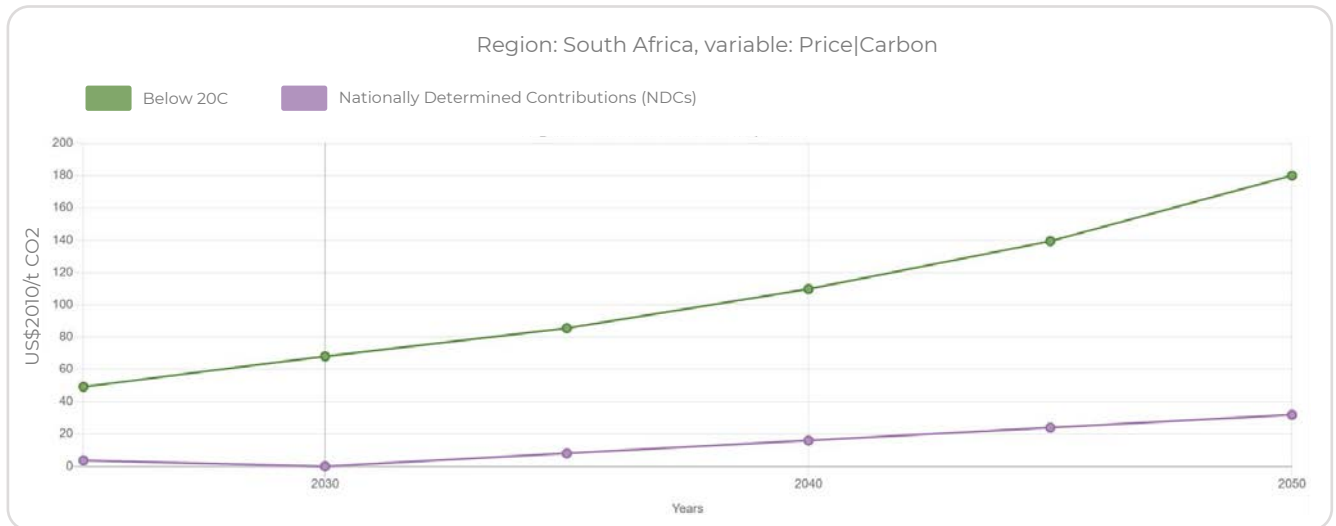
All NDCs across the continent can be segmented in the same way, providing a broad view of regional climate-related policy areas and economic ambitions.

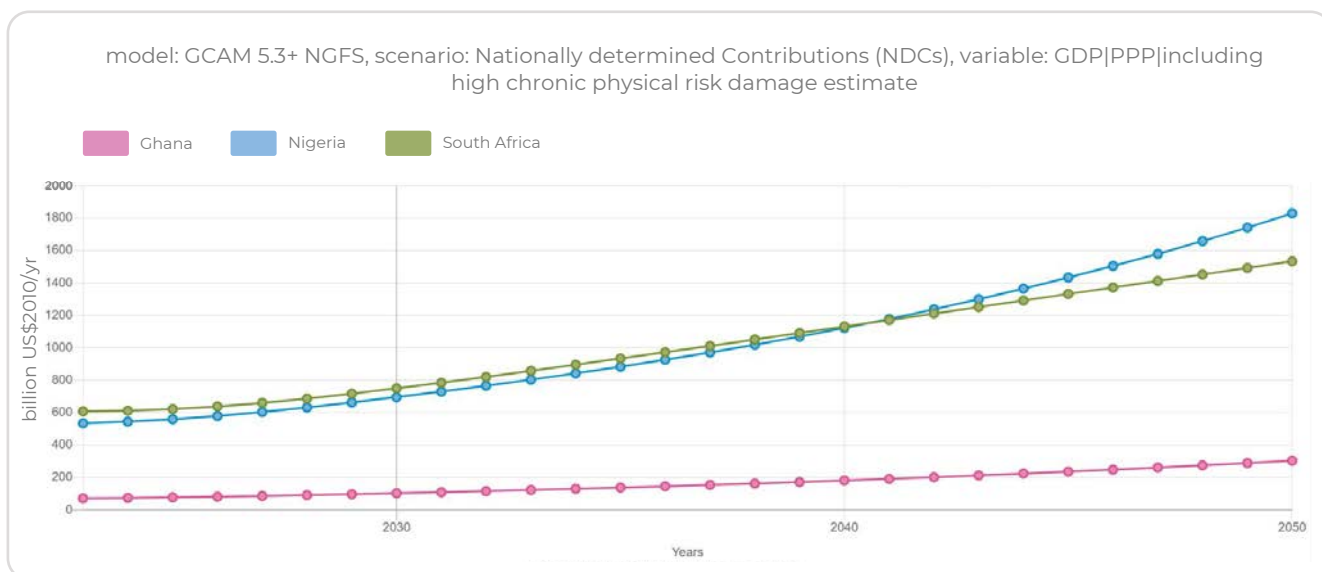
Costs associated with NDCs have been estimated...

The 'Network for Greening the Financial System' (NGFS) is an international collective of central bankers and economists who analyze climate policies and pathways with a view to putting costs against them. The NGFS view the issue in myriad ways, including:

- › No action.
- › 1.5-degree limit
- › 2-degree limit
- › Delayed transition
- › NDC
- › ...

This analysis provides the means to increase the dimensionality of African climate initiatives, from target sectors and actions, to costs, along multiple scenarios. There are two strong alternatives for the costing of policies - the first is to use the estimated GDP impacts, with the second using the implied cost of carbon that is calculated locally and can be used in the context of stated targets. Both are reasonable starting points for putting dollar values against NDCs.





The combination of researched policy outlines, along with analyzed costs to their affected economies, provides enough data for banks to estimate how countries, sectors and industries they lend to may be impacted by these additional costs. Once those impacts are estimated, they can be translated into impacts on borrower credit riskiness, economic capital and the rise in potential liquidity risk.

African Central Banks are taking notice and moving towards regulatory reporting...

Increasing climate-related risks to banks cover all areas, but the most concerning to central banks and regulators across Africa are credit and liquidity risk amplifiers. This mirrors the analysis emerging from the 'Basel Committee on Banking Supervision' (BCBS), which published, in June 2022, '[Principles for the effective management of climate-related financial risks](#)'.

The paper's 12 key principles are as follows:

Principle 1: Banks should develop and implement a sound process for understanding and assessing the potential impacts of climate-related risk drivers on their businesses and on the environments in which they operate.

Principle 2: The board and senior management should clearly assign climate-related responsibilities to members and/or committees and exercise effective oversight of climate-related financial risks.

Principle 3: Banks should adopt appropriate policies, procedures, and controls that are implemented across the entire organization to ensure effective management of climate-related financial risks.

Principle 4: Banks should incorporate climate-related financial risks into their internal control frameworks across the three lines of defense to ensure sound, comprehensive and effective identification, measurement and mitigation of material climate-related financial risks.

Principle 5: Banks should identify and quantify climate-related financial risks and incorporate the ones assessed as material over relevant time horizons into their internal capital and liquidity adequacy assessment processes, including their stress testing programs where appropriate.

Principle 6: Banks should identify, monitor and manage all climate-related financial risks that could materially impair their financial condition, including their capital resources and liquidity positions. Banks should ensure that their risk appetite and risk management frameworks consider all material climate-related financial risks to which they are exposed and establish a reliable approach to identifying, measuring, monitoring, and managing those risks.

Principle 7: Risk data aggregation capabilities and internal risk reporting practices should account for climate-related financial risks.

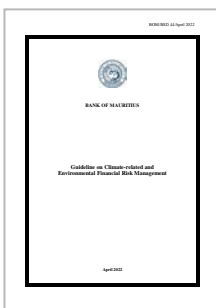
Principle 8: Banks should understand the impact of climate-related risk drivers on their credit risk profiles and ensure that credit risk management systems and processes consider material climate-related financial risks.

Principle 9: Banks should understand the impact of climate-related risk drivers on their market risk positions and ensure that market risk management systems and processes consider material climate-related financial risks.

Principle 10: Banks should understand the impact of climate-related risk drivers on their liquidity risk profiles and ensure that liquidity risk management systems and processes consider material climate-related financial risks.

Principle 11: Banks should understand the impact of climate-related risk drivers on their operational risk and ensure that risk management systems and processes consider material climate-related risks.

Principle 12: Where appropriate, banks should make use of scenario analysis to assess the resilience of their business models and strategies to a range of plausible climate-related pathways and determine the impact of climate-related risk drivers on their overall risk profile.



Examples of the incorporation of the BCBS paper can be seen across Africa, with Mauritius, a 'Small Island Developing State' (SIDS) that is highly vulnerable to climate change, being an example. Its own April 2022 '[Guideline on Climate-related and Environmental Financial Risk Management](#)' expects climate change to sit within banks' standard risk management. Climate-specific analysis and reporting must:

- 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.

- › 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.
- › Ensure that the risk appetite framework incorporates relevant risk exposure limits and thresholds for risks.
- › Encompass measures to encourage counterparties to provide relevant disclosures on climate-related and environmental financial risks.

The message is very clear: climate change increases credit and liquidity risks from both its physical effects and the costly transitional policies created to halt its progress. African banks need to expand their current risk frameworks to explicitly include these risks.

Africa has other incentives to move quickly on climate-related financial risk regulation...

In 2022, Egypt hosted COP 27, where the major accomplishment was forward movement on the long-discussed 'Loss and Damage' fund. This concept is that high GHG emitting countries, where their economic development has been based, at least partly, on fossil fuels, pay into a fund to be used to assist highly impacted, low emitting countries. In Egypt, the fund was agreed upon in principle, but how it will be funded was left for analysis and reporting at COP28.

This becomes important in the context of regulation as it creates a new incentive for Africa to be seen as leading the way in terms of building green economies. As one of the most highly climate change impacted areas of the world, it must become the example of 'green' best practice to make a case for funding the 'Loss and Damage' fund inarguable.

The time for banks to take action is now...

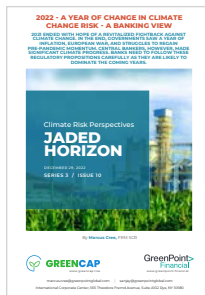
African banks must include climate-related risks within their standard risk management frameworks and risk appetites. This means:

- › Creating forward-looking scenarios that mirror published climate pathways, including physical and transitional elements.
- › Applying these scenarios to loan books and balance sheets.
- › Creating climate-influenced 'shadow' changes credit profiles and ratings.
- › Calculating changes in economic capital and implied loan spreads.
- › Incorporating these results into credit risk reporting and 'Contingency Liquidity Planning'.

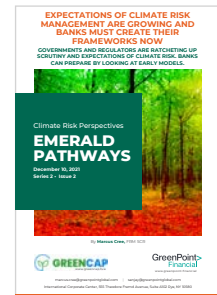
This will not only bring them into line with the regulatory trend towards specific climate-related risks, but also provide risk departments and governance committees with insights into emergent risks, which will allow them to prepare and strategize accordingly.

The recent changes in the global approach to climate-related financial risk has been covered in:

[2022 – A year of change in climate change risk – A banking view](#)

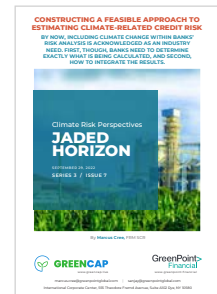


[Expectations of climate risk management are growing and banks must create their frameworks now](#)



Climate scenario building within banks has been covered in:

[Constructing a feasible approach to estimating climate-related credit risk](#)



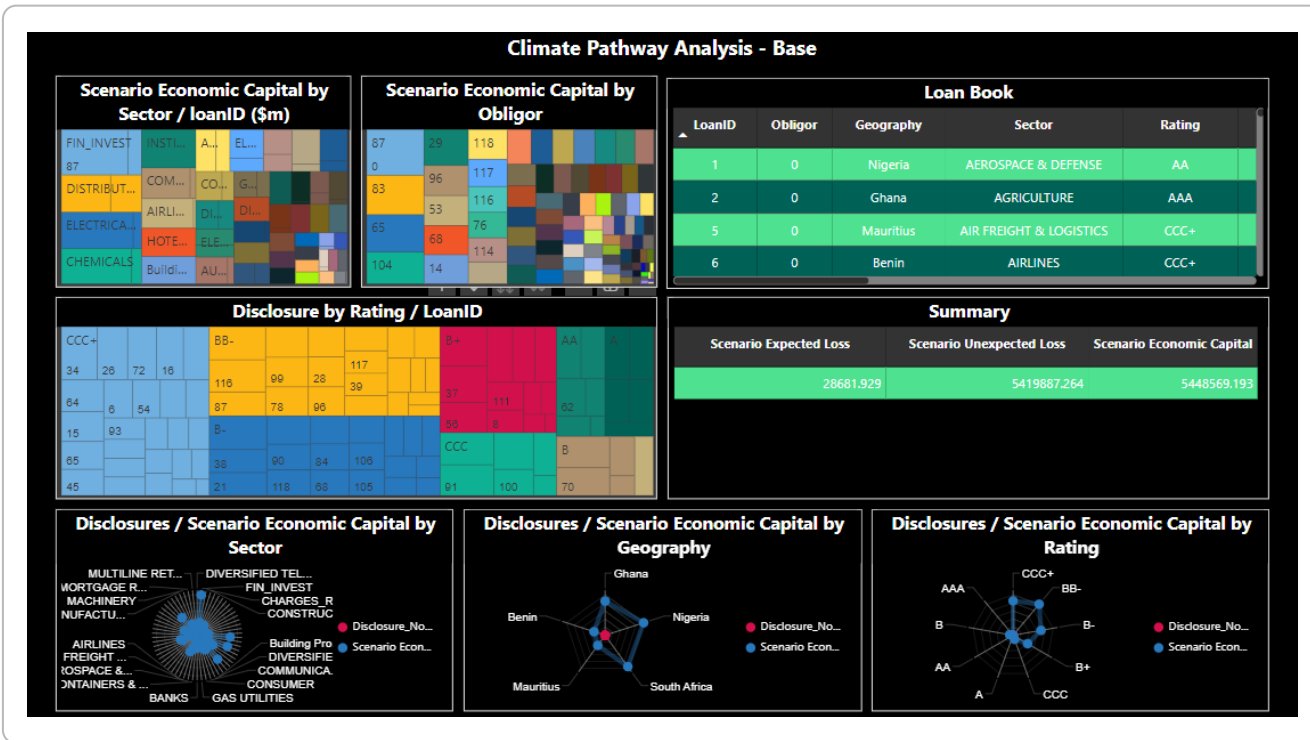
GreenCap can help...

GreenCap is a 'Risk As A Service' (RaaS) solution that enables banks to run transitional and physical risk assessment against their balance sheet that reports individual loan and portfolio level, providing:

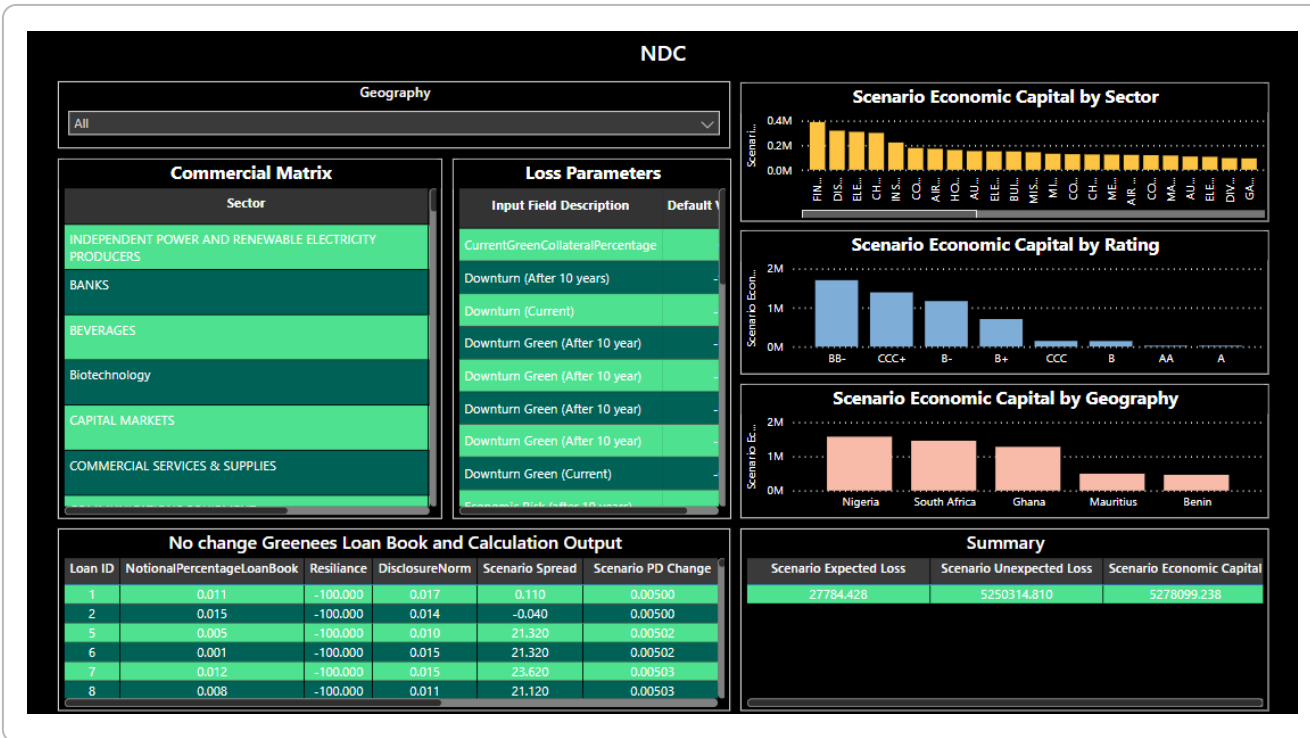
- Implied PD changes across multiple climate pathways
- Economic capital changes - Broken into expected and unexpected losses
- Implied spreads on climate-impacted loans

The system supports multiple scenarios and pathways and allows bottom-up adaptations to be added at the customer level for fine-tuning risks and exposures. As a cloud service, GreenCap is extremely fast to implement and use for exactly the type of analysis that is being, or about to be, asked for by Central Banks across Africa.

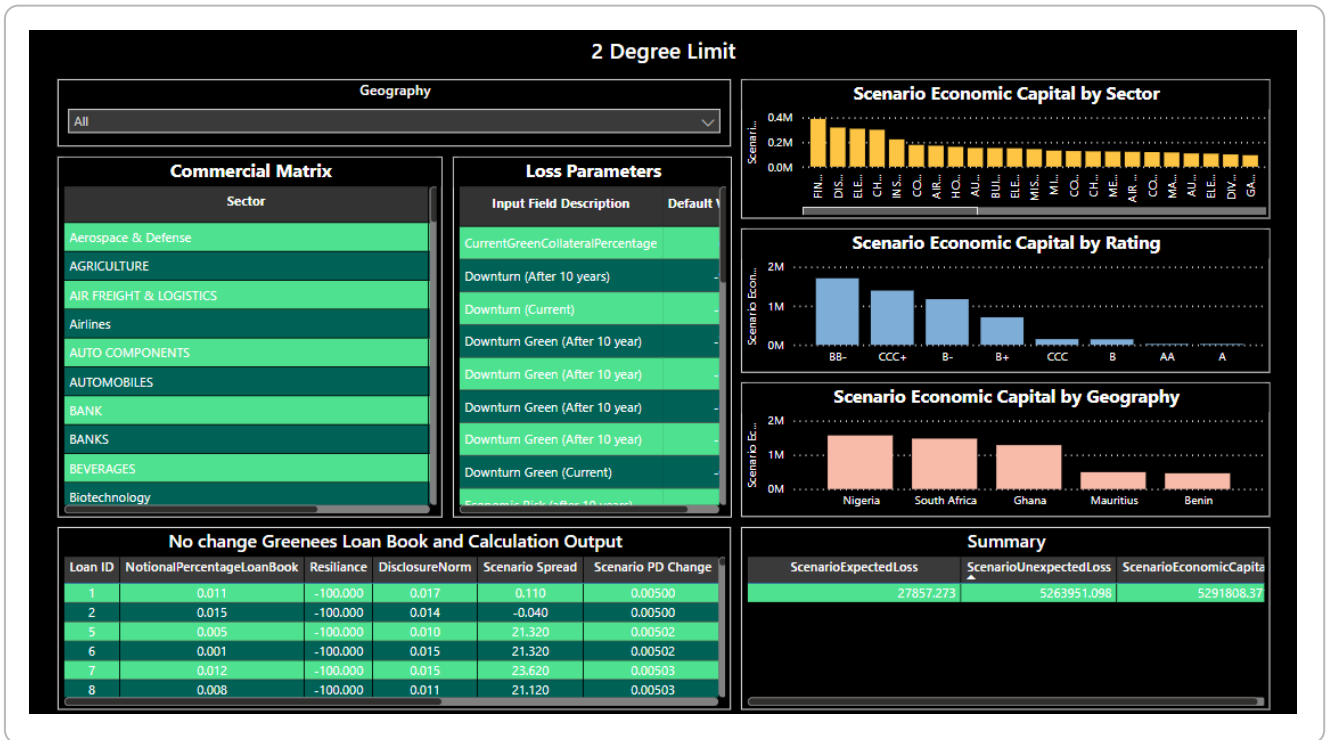
Africa system main page



Scenario



Scenario



GreenCap is designed to be used by banks of all sizes.

Visit [GreenCap.live](https://www.greencap.live) for more insights and resources designed to assist banks in navigating the challenges posed by climate change and policies introduced to mitigate it.



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 co-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.