# CODE RED - FROM THE IPCC ALERT TO THE COP26 RESPONSE

## INSIGHTS ON SUSTAINABLE FINANCE FROM THE UN CLARION CALL THROUGH TO THE WORLD LEADERS MEETING IN GLASGOW

Climate Risk Perspectives

# CODE RED INSIGHTS

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# INTRODUCTION

2021 has been an important year for climate change awareness. With a COP being held in November, world governments made a series of announcements to demonstrate about their commitment to reach the ambitions set out in the Paris COP, held in 2015. The EU, in particular, began a process of putting policies in place of pledges through its Green Deal initiative.

Mid-year saw the Intergovernmental Panel on Climate Change (IPCC) publish its most damning report to date, where it officially put the world on a 'Code Red' footing concerning both - the time remaining and the actions needed to avoid a catastrophic outcome. In short, to limit the global temperature rise to 1.5 degrees above 1990 levels by 2100, the world must be at net zero by 2050. That target requires almost all remedial policies in place by 2030.

Private finance is necessary to make up for yawning shortfalls between government commitments and investments. This leaves bankers interpreting environmental policy, scientific pathways, UN responsible banking guidelines, circular economy reports, and what amounts to an entirely new risk category. Failure to properly plan for the 2020s' green economic overhaul could leave banks with serious credit and liquidity issues.

The GreenPoint 'Code Red' series was written to explore and explain issues faced by the banking sector regarding climate change. Its focus was also to provide a blueprint for creating strategies that allow banks to become agents of change, working with their customers to create a controlled transition to a greener and more prosperous future.

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## Chapter 1

# IPCC PUTS THE WORLD ON HIGH ALERT

## NGFS PROVIDES A PATH FOR THE BANKING INDUSTRY TO FIGHT BACK

Originally published on September 13, 2021

# The Network for Greening of the Financial System (NGFS) recently published the second phase of its framework for the economic impact of climate change and mitigation policies. In this article we review the framework and its importance in fighting climate change.

NGFS started in 2017 as a working group of central banks and regulators with the mission to translate the scientific pathways (being created by groups such as the IPCC) and policy commitments and announcements made by governments into economic scenarios and outcomes. There are currently 95 members of the NGFS, including the US, EU, Brazil, Japan, UK, and China.

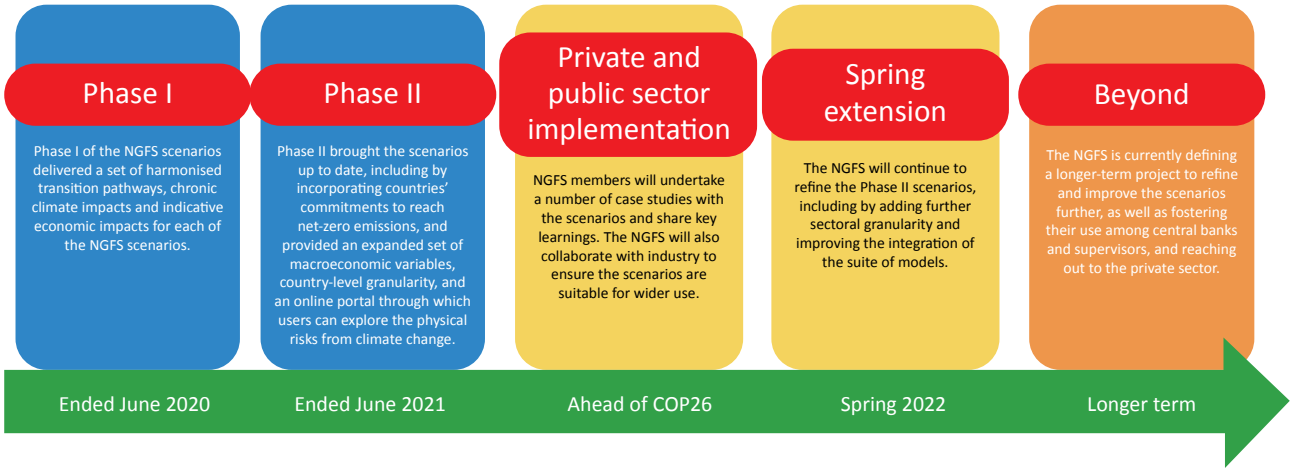
NGFS scenarios are defined by the resultant global temperature rise by 2100 and designated by the manner they are achieved. The scenarios are also split between physical (actual impact from climate change) and transition (impact from mitigation strategies and policies) risks.

This is an effective working framework that is continually refined and is working towards COP26 (The next big climate change conference to be held in Glasgow in November 2021) and beyond.

| | | Physical risk | Transition risk | | | |
|---|---|---|---|---|---|---|
| **Category** | **Scenario** | **Policy ambition** | **Policy reaction** | **Technology change** | **Carbon dioxide removal** | **Regional policy variation*** |
| Orderly | Net Zero 2050 | 1.5°C | Immediate and smooth | Fast change | Medium use | Medium variation |
| | Below 2°C | 1.7°C | Immediate and smooth | Moderate change | Medium use | Low variation |
| Disorderly | Divergent Net Zero | 1.5°C | Immediate but divergent | Fast change | Low use | Medium variation |
| | Delayed transition | 1.8°C | Delayed | Slow/Fast change | Low use | High variation |
| Hot House World | Nationally Determined Contributions (NDCs) | ~2.5°C | NDCs | Slow change | Low use | Low variation |
| | Current Policies | 3°C+ | None - current policies | Slow change | Low use | Low variation |

**Color coding indicates whether the characteristic makes the scenario more or less severe from a macro-financial risk perspective***

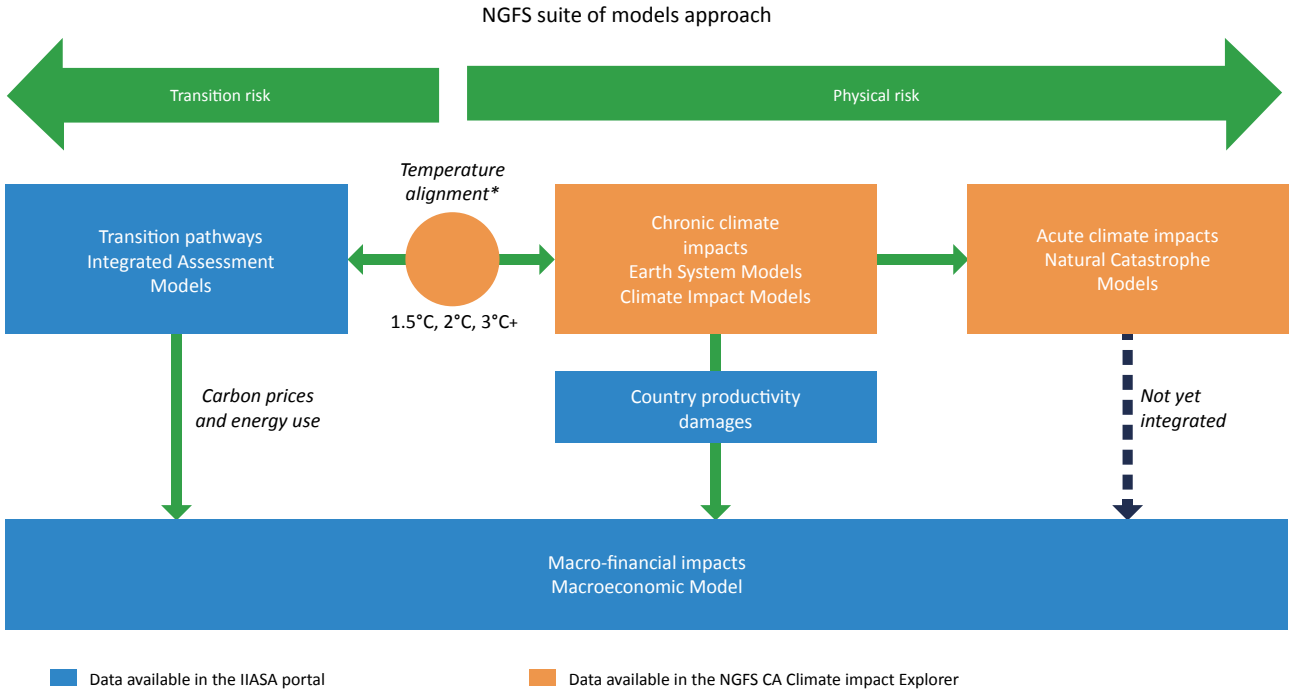
Lower risk  Moderate risk  Higher risk

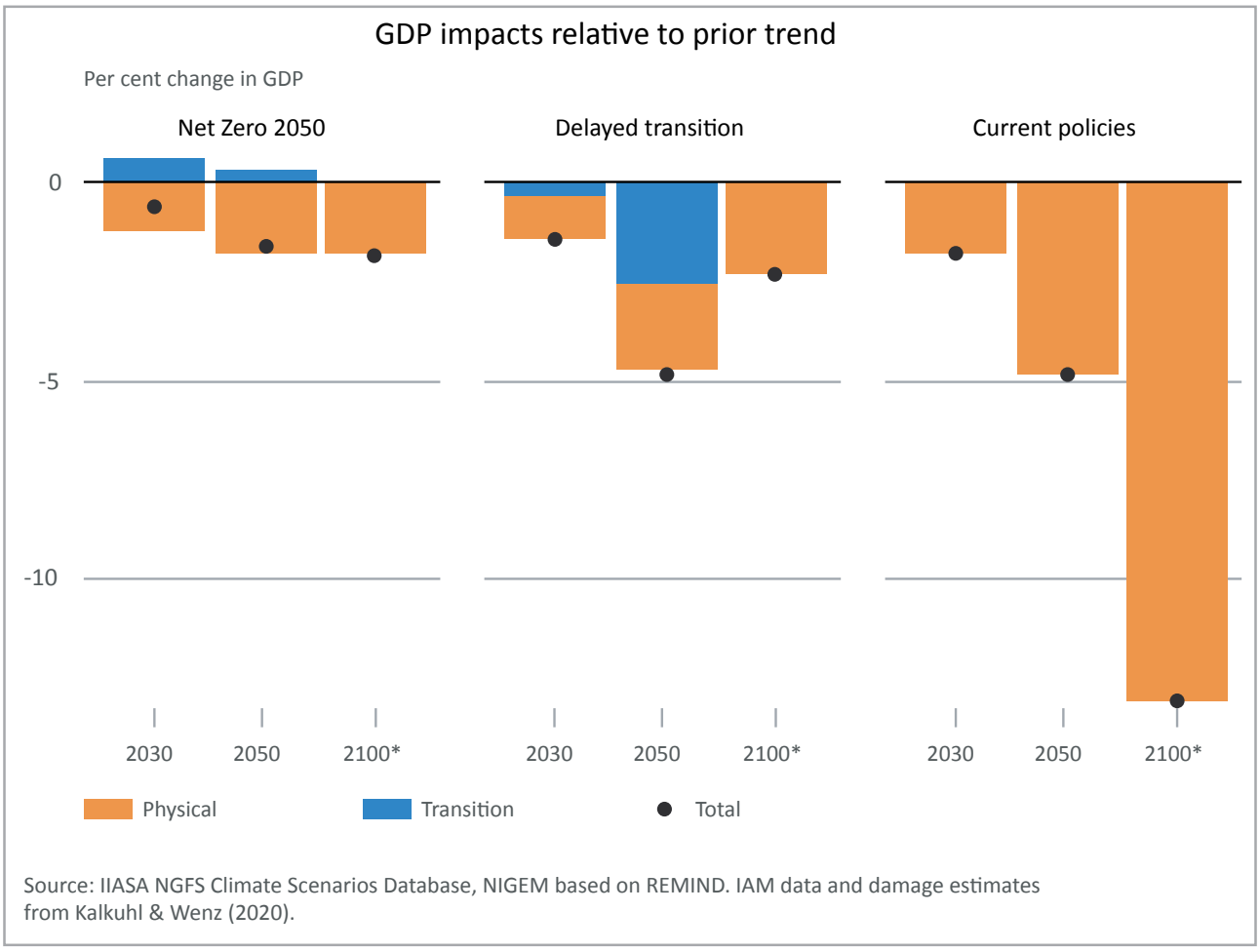



NGFS' mission is to create a viable top-down approach that can first be used as a common framework for central banks and planners, but can also be progressively adopted by the private sector.

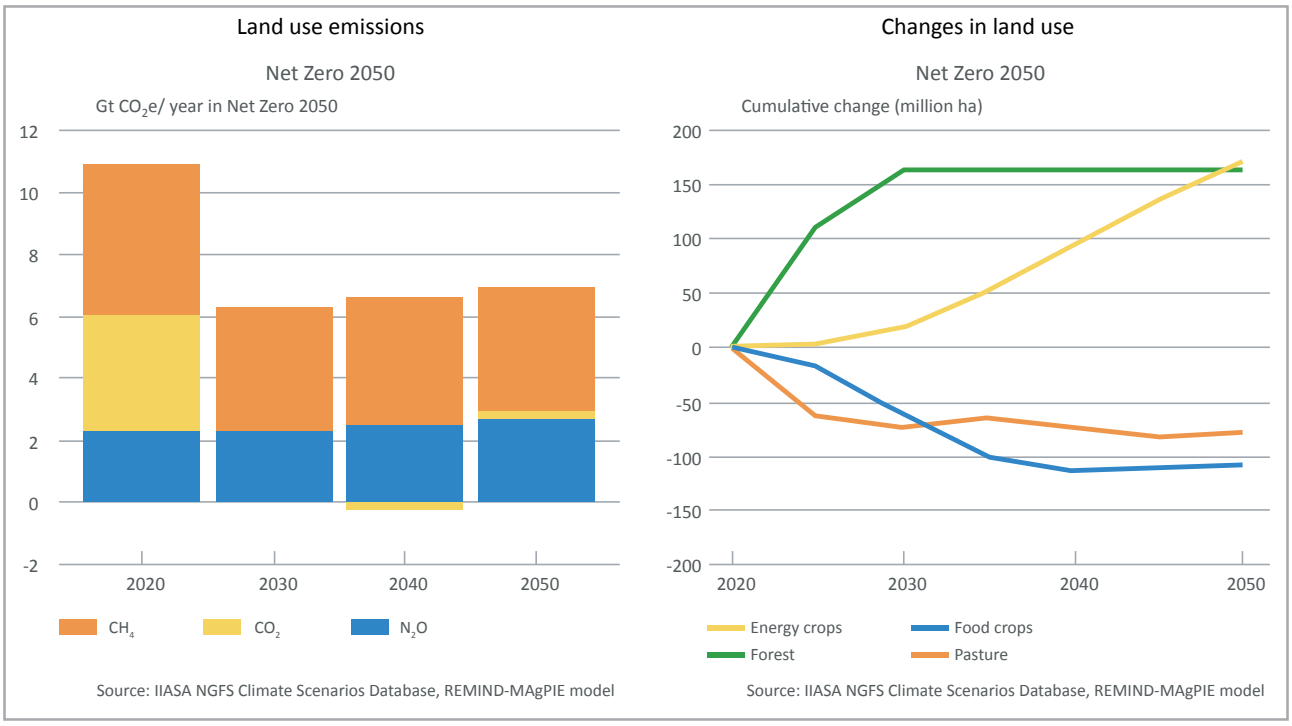
The applicability and effectiveness of the scenarios become apparent in the second stage of the adoption by the private sector. A high-level overview of the framework illustrates how the top-down impacts on GDP are estimated. These are then transformed into overall GDP impact based on policy status and implementation speed across various countries.

Importantly, the NGFS examines the economic indicators in each country, including, inflation, interest rates, unemployment, and across the sectoral span of those economies.






Source: IIASA NGFS Climate Scenarios Database, NIGEM based on REMIND. IAM data and damage estimates from Kalkuhl & Wenz (2020).




Source: IIASA NGFS Climate Scenarios Database, REMIND-MAgPIE model

Source: IIASA NGFS Climate Scenarios Database, REMIND-MAgPIE model

NGFS is an evolving undertaking – the second phase has more refined scenarios as well as their usage and explanations.

For banks, these scenarios are an ideal starting point for their individual climate-based analysis. They are created by the regulatory bodies that have jurisdiction over banks. The scenarios encompass much of the work involved in translating established science into tangible economics.

To utilize these scenarios, banks have to translate their balance sheets into correlated impacts as starting points to assess potential impacts to credit profiles of their underlying obligors. This impact is likely to create liquidity impact as scenarios become real. Deterioration in obligor creditworthiness would require higher capital provision, in turn impacting their overall capital base. The aggregate impact on systemic capital would impact the a sustainable future for the climate.

**Banks are advised to study and apply these scenarios and take an active role in the fight against climate change.**

## Chapter 2

# AGRICULTURAL SUSTAINABILITY

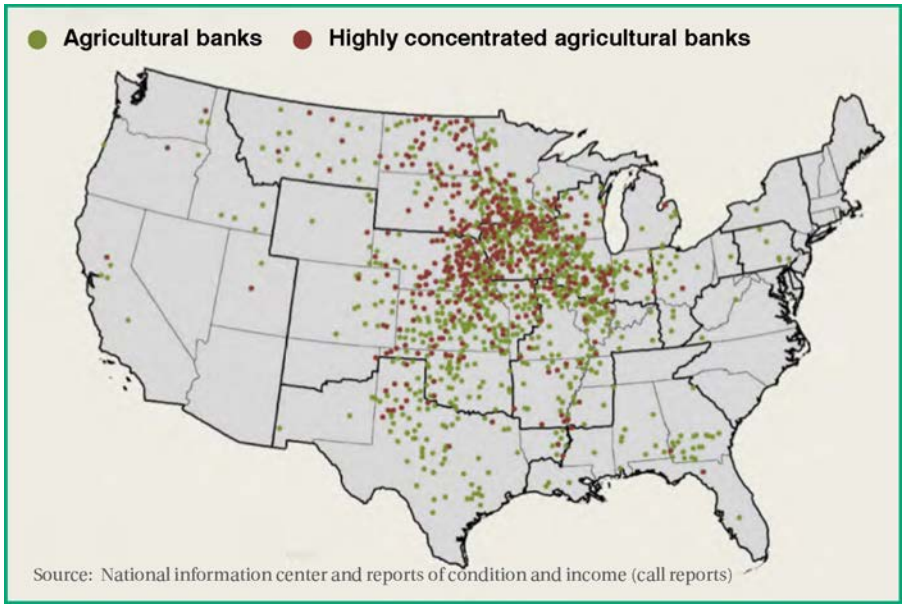
## WHAT THE BANKING SECTOR MUST DO

Originally published on September 21, 2021

## Climate change awareness and rising concerns have directed focus on sustainable agriculture. The Environmental Defense Fund (EDF) has been exploring the role of banking in agricultural sustainability (Financing Resilient Agriculture.)

Its major findings are:

- The farming sector is at the front-line of climate change from the perspective of cause and effect – from contributing to temperature rise to facing the consequences: droughts and fires; and extreme rainfalls, storms, and flooding.
- These risks are particularly acute for smaller farmers.
- 50% of lenders and banks to the sector have over 25% of their loan portfolio exposures to farming.
- Agricultural lending is local, leading to high geographic risk correlation.




A structured and systematic financial backbone for a climate-sustainable future will contribute towards:

- Stabilizing crop yields and long-term financial viability in the face of climate change.
- Enhancing water quality and quantity, biodiversity, reduction in greenhouse gas emissions, and carbon sequestration (climate change mitigation).

There are three key recommendations:

- Assessing climate risk at the bank/lending institution-level.
- Understanding the role of resilient agriculture in managing climate risk.
- Designing lending programs or products that support farmers in building climate resilience.

## • Climate change issues facing agricultural banks in the US

The idea of including climate change into banking is not new. Internationally, several bodies including the Task Force on Climate-related Financial Disclosures (TCFD) have developed reporting frameworks for banks to audit their financing of CO2 emissions, referred to as scope 3 disclosures. However, their focus is on CO2, and it leaves the agricultural lending sector with a unaddressed areas including;

- Farms are exposed to the physical risks of climate change. This includes the impact of climate risk mitigation policy measures that will affect their capacity to conduct business.
- Sustainability issues facing farms and their lenders are highly complex, involving irrigation, water quality and greenhouse gasses such as methane – one of the main issues with beef farming.
- Lenders to the agricultural sector are exposed to much more than physical risks to their farms. They are typically involved in the entire supply chain financing, from equipment to processors and transportation.

The report makes it clear that banks are an integral part of the farming ecosystem and will play a vital role in creating financing and lending frameworks and products to enable the US agricultural sector to transition towards a greener, more viable future.

## • Response to the emerging crisis

This decade is critical for changes in energy production and usage as well as agricultural production. Banks must be able to predict where risks would change across the supply chains. In effect, this would radically transform the risk profile of their balance sheets

Unfortunately, this is underway at the tail end of the regulatory responses to the 2008 credit crisis, whose measures include:

- Increased liquidity ratio reporting
  - Liquidity Coverage Ratio (LCR)
  - Net Stable Funding Ratio (NSFR)
- Introduction of liquidity simulations
  - DFAST/CCAR
- Forward looking credit-based accounting provision
  - Current Expected Credit Losses (CECL)

The result is clear – capital requirements as a buffer for systemic risks have become extremely onerous for banks. These regulations also imply that deteriorating credit exposures in their loan portfolios will be significantly costlier for banks. Banks are not only part of the local ecosystem, but they are facing the same risks as the farming sector.

## • The banking sector is critical in the green transformation of the agricultural sector

With all the possibilities and unknowns inherent in the climate change challenge, it is simplistic to assume that very little can be done until reliable data is available to make rational decisions. The agricultural sector needs financial backbone and support now. This implies creating new lending frameworks and products and actively working with the agricultural sector to price farming loans to encourage sustainability.

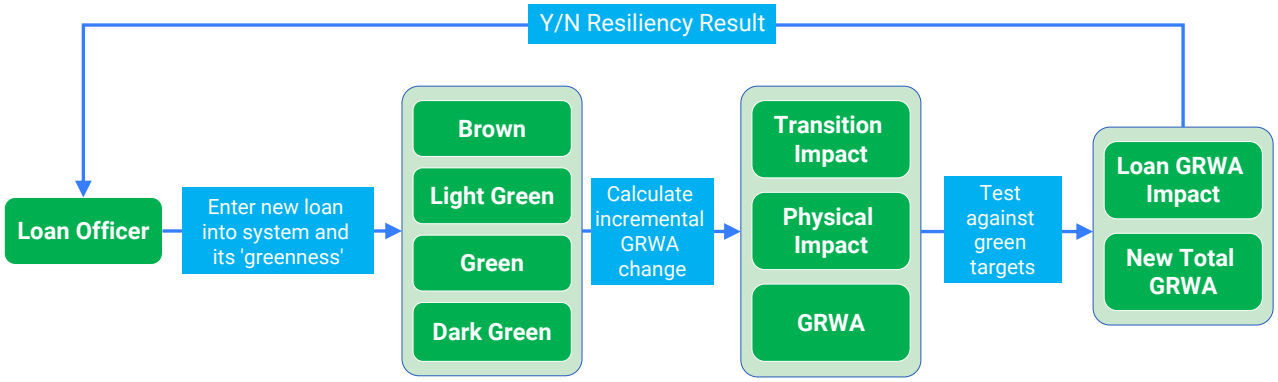
Banks should price evolving changes in creditworthiness in the agricultural sector:

- Positively, by farms adopting practices that adhere to climate and environmental policies, as well as ensuring protection from physical effects.
- At the same time, they must not ignore potential regulations until enforcement is imposed on them and fail to act to protect against physical impacts.

Banks need a system to build climate change into their credit and pricing policies. This needs to be within their current frameworks for calculating the underlying risks. To state this in banking terminology – there needs to be appropriate basis point adjustment on loans that supports climate risk mitigation and supports the agricultural sector to survive and flourish.

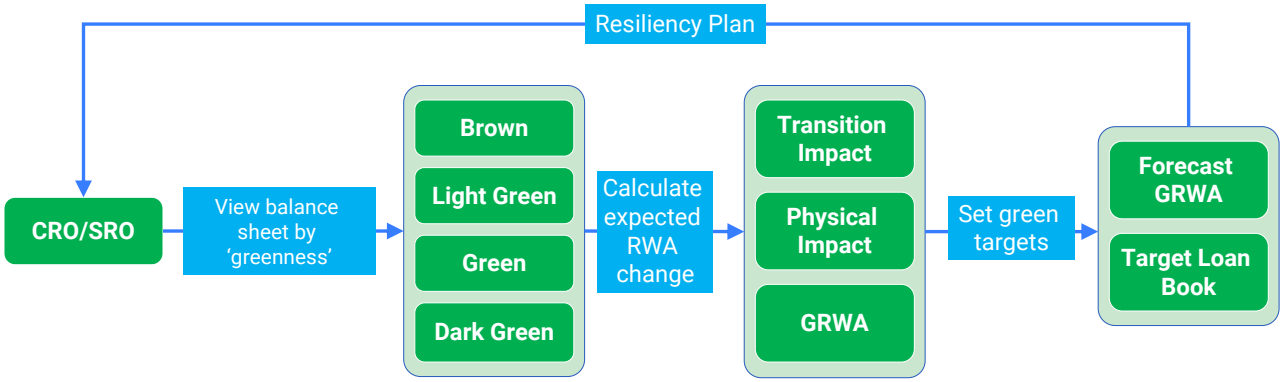
## • Greening the credit framework

Greenpoint has built a framework that allows banks to calculate the transitional and physical risks into the credit-based capital (GRWA - Green Risk Weighted Assets) of the banks' balance sheets. Ultimately, this also allows pricing to be adjusted at the loan level to reflect sustainability efforts by the farm, creating a bottom-up approach to local banking.




By calculating and pricing resiliency into the rates, banks can work with their clients on an advisory level, bringing banking to the heart of environmental efforts.

From a top-down approach, banks can look at the whole supply chain, applying correlations to the impact. They can then adjust their strategies to avoid a 'brown' concentration that could be disastrous for banks if the crisis deepens along the worst predicted climate pathways.




Working with the data that is available and the best practices as advocated by the EDF, banks can structure their loan books and credit facilities to be fully prepared for the green future that lies ahead.

The system itself has been designed to be completely turnkey for Finastra clients and extremely simple to use for non Finastra banks.

## Summary

There is a growing global and national interest in resolving the climate change challenge. We are already feeling the impact and US farmers are at the forefront of that change. Agricultural and community banks have to be active and integral to the system as it changes. To achieve this, they must maintain stability by using the optimal processes, the applicable data as it become available and by encouraging best practices. GreenCap has been designed and built with the goal to assist every bank in achieving those goals.

## Chapter 3

# EU'S GREEN POLICIES NEED ESSENTIAL SUPPORT BY FINANCIAL INSTITUTIONS

## FOR THE EU TO BE FIT FOR 55, BANK RISK MANAGEMENT NEEDS TO BE FIT FOR 22

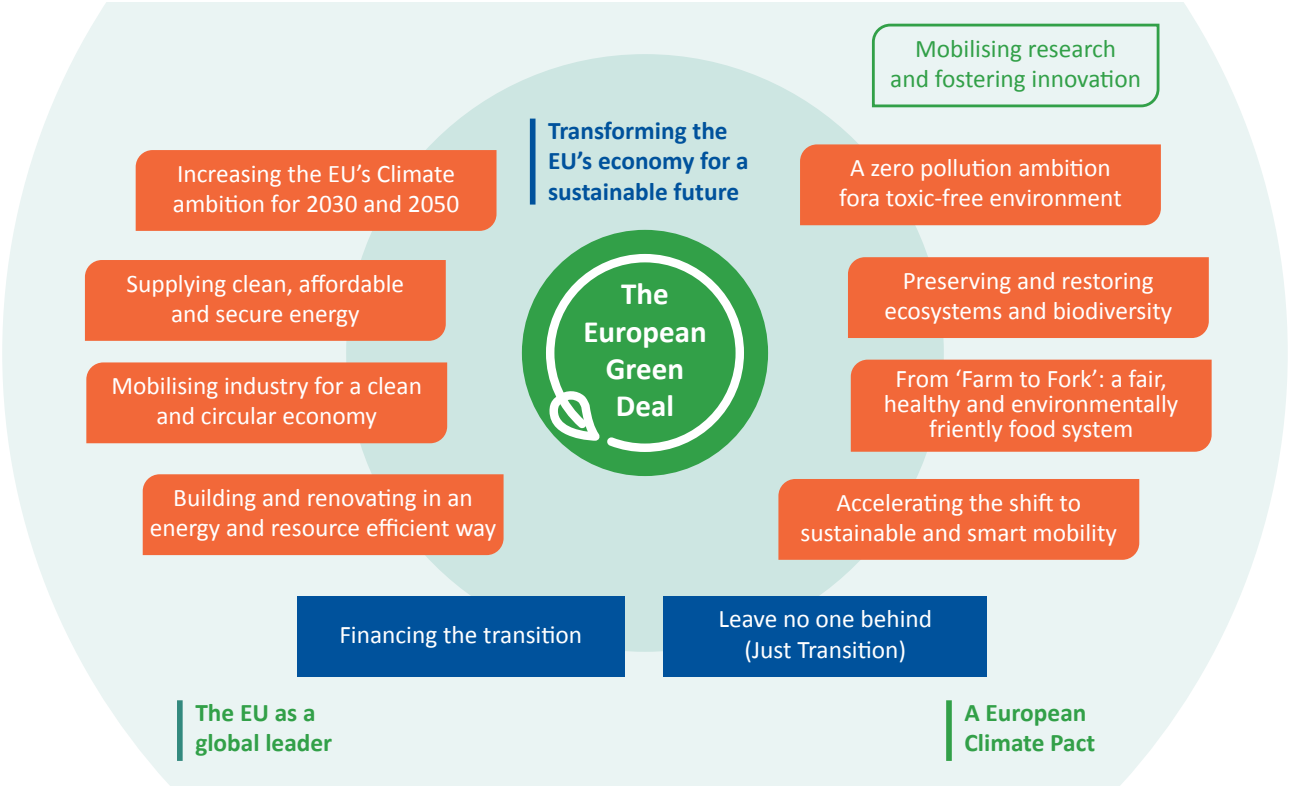
Originally published on October 1, 2021

## In the run-up to the COP26, The EU has published numerous policies to support its 'Green Deal'. 'Fit for 55'. These policies aim to reduce The EU's CO2 production by 55% (relative to 1990-level), with the goal to achieve this by 2030.

The policies cover multiple economic areas including:

- Expanding the scope of EU ETS (Emissions Trading System)
  - Include the maritime sector and implement CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) for aviation
  - Cover emissions from buildings and road transport
- Introducing new CO2 emission targets for new cars and vans from 2030
- Reforming the regulation on Land Use, Land Use Change, and Forestry

The EU had begun the legal process to meet or surpass its 'Paris' commitments, referred to as the 'European Green Deal'. A preview of its implications for The EU banking sector is provided below:




EU's fight against climate change is a critical case study given the complexities involved in achieving the radical transformation required to hold global warming to 2 degrees or less by 2100. The EU must maintain economic growth and competitiveness while transforming heavy industry, supply chain management, agriculture, transport, and energy infrastructure across and between its 27 member states.

A key point here is that the 'just transition' included in the plan applies to everyone equally and leaves no one behind. Creating an economic environment that supports green jobs is central to transitional planning. The vital need for this is clear in light of cost estimates and funding plans for the transition. Indeed, in its 2020 report, McKinsey estimated a total investment of $28 trillion over 30 years ($800 billion per year) to decarbonize the European economy.

Significant investments are required in several areas to meet EU's goals:

- **Power Grid**
  The EU power grid is a complex web but The EU has a well-established renewable sector. Further investment in storage, renewable production, and alternatives such as nuclear and green hydrogen is needed. Within the EU, there are rules that govern the power sector around production and purchase from neighbouring states. Banks and lenders play a major part in this process, ranging from funding power infrastructure to providing credit facilities for hedging, and forward purchasing of power by supply and energy trading firms.

- **Transportation**
  This sector largely relates to the electrification of vehicles. With ambitious targets for electrical vehicles and economic growth, major changes have been witnessed and need to be accelerated to transform the automobile industries. From a policy perspective, tighter restrictions on combustion engines by 2030 will greatly impact the transportation industry.

- **Shipping**
  The EU is a major exporter and importer, with shipping being one of its core industries. This sector is exposed in two ways: directly—to decarbonize through its fuel use; and indirectly—via restrictions on the production of goods being transported. Also, innovations such as biofuel use and fixed sails on merchant ships, are being actively explored. The shipping industry has long relied on bank credit facilities to fund its operations and manage its complex cashflows. Banks need to offer finance-related incentives to support the 'greening' of this sector.

- **Agriculture**
  Farming and land management is perhaps the most complex of all sectors as EU's growing population requires increasing food production also to become more sustainable This includes fertilizer and land use, as well as changes to areas such as beef production, which contribute significantly to methane production. Banks play a major role in managing the cashflow for the farming sector and are in the prime position to work with farmers to make it sustainable.

- **Built Environment**
  Constructing a sustainable and energy-efficient building is well generally well-understood however, renovating the existing building stock across 27 countries is a daunting task. This is economically and politically challenging, but can be achieved through a mix of regulations where the onus is put on the building owners, but they will need banks to aid in financing for compliance.

- **Industry**
  The EU's GDP of around 15 Trillion Euros, the major contributor being its well-established industrial sector. This sector needs cautious policy planning as it impacts the culture and living standards across the union. Banks would need to finance the transition as policies

'orphan' existing firms and industries while creating high growth opportunities in the new green economy. Understanding the timing of the transition and the possibilities for innovation and adaptation would determine if banks' balance sheets determine a greener future, or a potential credit crisis.

The EU budget and the NextGenerationEU provides roughly 140 billion Euros per year. Thus, EU would need private-sector finance for its 'Green Deal' to the tune of 660 billion a year for 30 years. Managing financing in the transition process through an ongoing series of policy announcements would require banks to determine:

- **Regulation Timing**
  This includes both timing of the introduction and the allowed compliance period.

- **Adaptation**
  Firms will be able to refocus on greener production rather than become extinct during the transition. Adaptation can often be cheaper as it reuses existing equipment and land. Therefore financing should be encouraged for existing companies to adapt to the needs to be a significant part of the green mix.

- **Competition**
  The EU has strong history of protecting its markets, but these effort are limited to its internal markets from external competition. This needs to be considered when viewing the credit risk profile of commercial, exporting, borrowers.

- **Innovation**
  Recently, the EEA released: 'With People and for People: Innovating for Sustainability." This report discussed the contribution of social and technological innovation towards more sustainable societies. The EU will undoubtedly encourage innovation in this sector but this carries risks for banks as competing technologies create big winners and losers from the perspective of financial lending.

- **Non-CO2 Reduction Policies**
  Climate-related policies are often viewed as an equivalent to CO2 reduction measures. However, this ignores other greenhouse gases that are also being addressed. An example of this is the methane pledge recently made by the US and EU, with the aim of a collective 30% cut in methane production by 2030. Stringent policies on agriculture, industry, and waste management are needed to meet this pledge.

There is no doubt that the current system of scope 3 disclosures (which asks banks to audit their balance sheets and report on the CO2 production they have financed) is only a small tip of a large iceberg in terms of financial risks caused by climate change and the policies designed to combat it in the EU. These material risks to banks' balance sheets and profitability need to be measured and managed as a specific risk category.

GreenCap believes that banks must be able to:

- Measure the impact of known and expected climate policy on their current balance sheet.
- Compare the financial impact of climate change documented to the reported 'scope 3' disclosures, so that the emissions reporting is consistent with the actual risks to the bank, and where it is not, the discrepancy can be explained to the management and investors.

- Put in place strategies that are understandable and well-communicated to manage the transition from a bank liquidity perspective by implementing hard green targets for the balance sheets.
- Encourage new borrowers and existing customers to adapt or innovate from the old 'brown' economy to the new 'green' one.


With a framework in place to achieve these goals, banks can become the engine of change that could realize the ambitions of the EU 'Green Deal', from implementing its recent policies through to the 55% CO2 and 30% Methane reductions by 2030 and beyond.

## For the EU to be fit for 55, bank risk management needs to be fit for 22.

## Chapter 4

# CLIMATE CHANGE DISCLOSURES LEAVE BANKS EXPOSED

### BUSINESS POTENTIAL IS BEING IGNORED

Originally published on October 7, 2021

**In 2021, the world is focused on climate change, with the physical impacts of the Anthropocene wreaking havoc across the world, including central Europe and North America, with 'once in a century' floods and fires becoming regular news items. Governments and scientists around the world have identified potential pathways and outcomes and have developed systems to audit greenhouse gas (GHG) emissions. The financial system has been pulled into this global program with many banks disclosing the GHCs they finance, but we need to ask whether this represents risk management in the crucial sector of climate change.**

First, we need to understand the GHC emission disclosures themselves.

## Who defines the disclosure framework?

The Financial Stability Board is an international body that was established to identify and assess vulnerabilities within the global financial system. As an ongoing exercise, the FSB aims to promote a culture of regulatory best practice globally, with a remit to continually review and develop regulatory best practices as markets develop.

The Task Force on Climate-Related Financial Disclosure (TCFD) was established by the FSB to specifically develop effective climate-related disclosures to improve investment, credit, and insurance underwriting within the global financial system. The focus of the TCFD is the carbon-related concentration of businesses, and to that end, they have developed a framework of scope 1, 2, and 3 disclosures that are designed to bring transparency to this area.


TCFD aims

An important feature of the framework is that it applies across industrial sectors, including the financial sector. It is intended to be useful for investors, regulators, and governments when looking at the economy as a whole, with respect to its GHG emissions.

## What are the differences between scopes 1, 2, and 3?

Scope 1 - Direct Emissions
Direct GHG emissions are those that are directly produced by the firm. This includes actual CO2 emissions from any equipment, vehicles, etc that are produced as a result of the firm's normal business.

Scope 2 - Indirect Emissions - Purchased Electricity Emissions
Indirect emissions are basically defined as the emissions created by the production of electricity used by a firm. This forces businesses to look at both the amount of electricity they use and the source of that electricity.

Scope 3 - Other Non-Direct Emissions
Optional reporting on emissions that are a consequence of the activities/services of the firm, but not created by the firm. This is the scope where banks are specifically asked to audit their balance sheets for the amount of CO2 emission they finance through loans and credit facilities.

The full report and recommendations of the TFCD are included in the report 'Recommendations of the Task Force on Climate-related Financial Disclosures' which can be read here here

## Are the disclosures mandatory for banks?

The TFCD makes 'best-practice' recommendations based on general consensus, but these need to be adopted by regional regulators to become mandatory. This is happening, with financial bodies around the world adopting the framework, and with many banks voluntarily making the disclosures. An example of this is the EU, where the European Commission has published 'Guidelines on reporting climate-related information' (which can be read here)

As an example of reporting, we can take a deeper dive into the EU guidelines to see exactly how banks are impacted.

The aim of the EU report is to provide sufficient information for investors and financial institutions to direct capital to sustainable ventures across the economy. The 6 principles that apply to the reporting are that it should be;

- Material
- Fair, balanced and understandable
- Comprehensive but concise
- Strategic and forward-looking
- Stakeholder oriented
- Consistent and coherent

Banks are expected to report scopes 1 and 2, as operational businesses, but these are expected to be small. Particular attention is expected on their scope 3 disclosures, set out as specific KPIs as follows

| KPI | Unit of Measure | Example | Rationale | Alignment with Other Reporting Frameworks | EU Policy Reference |
|---|---|---|---|---|---|
| Amount or percentage of carbon assets in each portfolio in M€ or as a percentage of the current portfolio value[31] | M in reporting currency / percentage | €20 m or 20% carbon-related assets of bank's equity portfolio | Show awareness of the exposure of portfolio to sectors affected to varying degrees by climate-related risks and opportunities. | TCFD Common Carbon Footprinting and Exposure Metrics | 2030 climate & energy framework |
| Weighted average carbon intensity of each portfolio, where data are available or can be reasonabl estimated[32] | $tCO_2e$/ M revenues in reporting | A bank reports the carbon intensity of its equity portfolio in terms of $tCO_2c$ per € m using | Show awareness of the exposure of portfolio to sectors affected to varying degrees by climate- | TCFD Common Carbon Footprinting and | 2030 climate & energy framework |

| KPI | Unit of Measure | Example | Rationale | Alignment with Other Reporting Frameworks | EU Policy Reference |
|---|---|---|---|---|---|
| | currency | third-party carbon data | related risks and opportunities. | Exposure Metrics | |
| Volume of exposures by sector of counterparty. | Reporting currency % of the total risk exposure | €l 250 m in energy sector accounting for 17% of total investments | Show the concentration of exposures towards high-carbon and low-carbon sectors. | TCFD Common Carbon Footprinting and Exposure Metrics | EU Low Carbon Economy Roadmap |

| KPI | Unit of Measure | Example | Rationale | Alignment with Other Reporting Frameworks | EU Policy Reference |
|---|---|---|---|---|---|
| Credit risk exposures & volumes of collateral by geography/country of location of the activity or collateral, with an indication of those countries/ geographies highly exposed to physical risk. | Reporting currency | € 750 m | Show the concentration of exposures and collateral in countries and geographies highly exposed to physical risks. | | EU Low Carbon Economy Roadmap |

| KPI | Unit of Measure | Example | Rationale | Alignment with Other Reporting Frameworks | EU Policy Reference |
|---|---|---|---|---|---|
| Volume of collaterals related to assets or activities in climate change mitigating sectors. | % of the total volume of collaterals | 12% of collaterals | Show the volume of green collaterals, e.g. with lower carbon exposure. | | 2030 climate & energy framework |
| Volume of financial assets funding sustainable economic activities contributing substantially to climate mitigation and/or adaptation (absolute figures and compared to total exposures) according to the EU taxonomy. | Reporting currency<br><br>% of the total risk exposure | €650 m accounting for 12% of lending portfolio | Show the concentrations of green investments and their resilience to climate change. | | EU Low Carbon Economy Roadmap |
| Total amount of the fixed income portfolios invested in green bond certified accourding to a potential EU Green Bond Standard if and when such a standard is approved, or accourdinf to ant other brodly recognised green band framework (at year-end) divident by(a 5-year rolling average of) total amount of holdings in fixed income portfolios. | Percentage and total amount in Reporting currency | Green Bond compared to vanilla bonds under-written or emitted | This indicator demonstrates commitment to green finance & the incestor's strategy & transition path towards alignment with a well bolow 2°C scenario.<br><br>It helps demonstrate track-record & forward-looking datacan underpin the investo's transition strategy with a robust key-performance indicator | The proposed draft version of ISO 14030 (October 2018) on green bonds already requires reporting on this indicator. | Upcoming EU eco - label on green financial Products.[33] |

The intent is clearly to fully audit the material CO2 impact of the banks' lending & financing activities. This information is then fully available for public scrutiny.

## Is this compliance, best practice, or risk management?

It is important to think about disclosures in the context of the wider efforts of the EU, and ultimately all other regional governments. The economy as a whole needs to be audited and monitored with regards to its GHC emissions and banks are just one part of that. The disclosures in themselves are in compliance with the reporting directives and good practice from a holistic economic viewpoint. They are not, however, risk management. They do not tell the bank anything about the potential losses it faces as a result of climate change, but rather act as the start point for that analysis.

## How can banks perform risk management against climate change?

Risk management is a live process of comparing opportunities with the risks of loss they represent and determining whether they both fit the bank risk appetite and represent a risk-adjusted value within that appetite. Climate change related risk is no different, and banks must view the disclosures from its current and potential customers as data points to properly price the risks it takes, whilst its own disclosures are data points for the government, as it makes policy.

To build from this, banks have to make use of some other core data sources.

- Intergovernmental Panel on Climate Change (IPCC) - This group performs constant analysis of the global warming situation, including projections for increased heating (by 2100) and provides pathways (scenarios) by which that heating can be held to specified levels. Notably, governments have signed up to a 2 degree heating maximum and so those pathways that have that end state are of most interest

- Net Greening of the Financial System (NGFS) - This group is made up of economists and central bankers who cost out the pathways from a quick starting, well planned perspective (orderly) and a late start starting reactive perspective (disorderly). This set of scenarios are then costed-out in terms of GDP impact, both globally and locally.

- International Energy Agency (IEA) - This group analyses policies and projections in the energy production and use and maps these to industrial sectors, providing predictive impacts across the global economy.

Taken with the TCFD firm level disclosures, these data sources provide a dataset that banks can use to create loss estimates across its balance sheet as well as for potential new customers. The general approach for climate change based risk management would be;

- Use the well researched outcomes and scenarios from the IPCC and NGFS to create the high (GDP) level losses that should be expected for the transition from a brown to a green global / regional economy

- Use the IEA data to correlate industries and sectors to the high level loss. This creates a benchmark, by sector, that can be applied to the loss calculation as a percentage

- Use the benchmark GDP loss to adjust the 'riskiness' of the current obligors via the Risk Weighted Asset (RWA) calculation, which informs banks and auditors how much capital must be held to secure the bank against credit based losses

- Use the TCFD disclosures to adjust, at obligor level, the exact correlation to the loss

This then provides a solid base to set funding targets that are in keeping with the bank risk appetite and stated climate change ambitions. The crucial difference between bank disclosures and climate

risk planning is the forward looking nature to the risk management and the fact that the bank can aim for specific levels. As the bank moves towards and achieves these targets, today's sustainability aims become tomorrow's disclosures. This provides stakeholders clear evidence of vision and action from the bank, as well as protecting the bank's balance sheet.

## Can banks move past risk management to risk opportunity?

The data from the TCFD can also be used to advise obligors on ways that they can reduce their exposure to current and predicted climate-related regulation, and the physical impacts of climate change. The scope 1 and 2 disclosures provide the basis for this advice, which is then translated into lower financing as it translates directly into a risk mitigant. This incentivized financing can be both a catalyst for meaningful change and greater bank market share of the growing sustainable sector.

## What else needs to be done by banks?

The focus of the disclosures is CO2 production and intensity. Banks finance industries and sectors that are exposed to a wider range of environmental risks and policies than those represented by the TCFD disclosures. These can range from forestry management to maritime activity, and all will face both transitional and physical impacts from climate change. These also need to be encoded in the losses and sector correlation matrices.

## SUMMARY

- Banks have a huge task ahead, in creating and managing a new risk category. Their success in this will have a material impact on the likelihood of reaching the aims and goals of the world's governments in terms of climate change. The nuances of how this risk interacts with traditional credit risk and RWA calculations will be the first major step in this process, and must be addressed immediately.

**GreenCap is designed to assist banks in their climate change risk management and fits in entirely with the efforts of the TFCD, IPCC, NGFS and IEA.**

## Chapter 5

# BANKING IS THE FOUNDATION OF SUSTAINABLE BUILDINGS

## IT IS IMPERATIVE FOR BANKS TO WORK WITH DEVELOPERS TO ENSURE A SUSTAINABLE BUILT ENVIRONMENT

Originally published on October 16, 2021

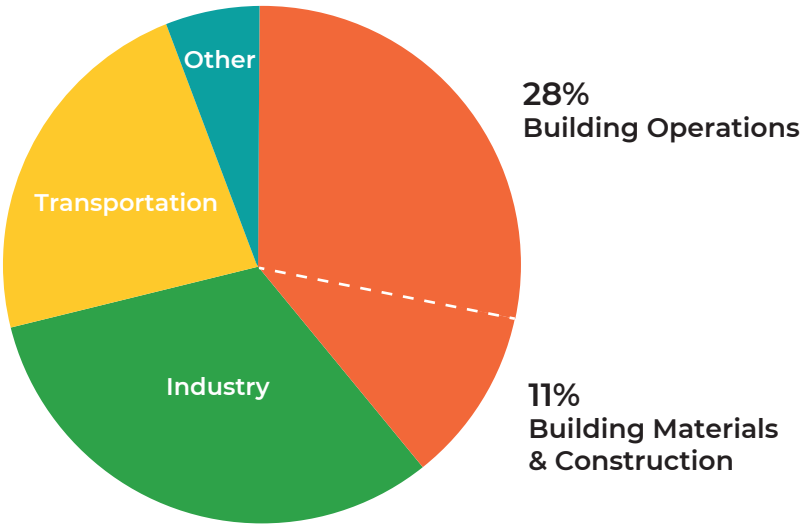
- **As the COP26 conference in Glasgow approaches, governments around the world are seeking solutions to enable them to meet their self-set targets to create a CO2-neutral world by 2050.**

- **Spending commitments in Europe & the US are already colossal, but are also less than a third of the estimated requirement. This means that the private sector will have to find the rest, while being corralled and coerced through subsidy and regulation.**

- **Banks are critical for this work.**

Buildings are prime targets for sustainable regulation. Accounting for 39% of total CO2 emissions, building construction (11%) and operation (28%), are areas where immediate and drastic action is needed to hold global warming to under 2 degrees, by 2100. Greenhouse gas emission reduction in these areas will involve changes to regulations for new buildings as well as massive investment in the adaptation of existing building stock—⅔ of which is expected to still be in use by 2050.

**Annual Global $CO_2$ Emissions**




**Data Sources Global ABC Global Status Report 2018, EIA**

Banks will face significant changes to borrower's credit profile in this sector as project costs to meet new regulations increase, and the values of existing buildings (the collateral on many such loans) plummet to incorporate the price of adaptation.

## Tracking a sustainable future...

The International Energy Agency (IEA) tracks the progress of various sectors with regards to sustainability goals. The building sector is graded as follows :

**Building Envelope** - This is defined as the exterior shell of the building that creates a barrier between the conditioned and unconditioned environment. Including both weather and heat protection, this is key to determining the ultimate energy needs. Therefore, is a core concern for policymakers. The IEA grades this area as '**not on track**'.

**Heating** - This covers how the building is actively heated, from wood-burning fireplaces to solar-powered electrical heaters. The IEA grades this area as '**not on track**'.

**Heat Pumps** - Heat pumps are specifically targeted, as the adoption of geothermal heating for water and air is seen as key to sustainability in the future. Hence, heat pumps are increasing being in new builds, but are still a costly adaptation to an existing building. The IEA grades this area as '**more effort needed**'.

**Cooling** - Cooling building interiors is more important than heating them in several parts of the world, and the current locked-in global warming is increasing these extremes. This sector is crucial to progressive designs and adaptation if buildings are to remain usable as we move through the century. The IEA grades the area as '**more effort needed**'.

**Lighting** - Lighting systems used in buildings have had the most impressive innovation, energy efficiency, adoption, and impact. The IEA grades this area as '**on track**'.

**Appliances and Equipment** - This is area where replacement and adaptation are likely to be a far bigger issue than innovation and adoption in new builds. The IEA grades this area as '**more work needed**'.

Overall, The IEA has the buildings sector set at '**not on track**'. This clearly implies that policy makers around the world have to act urgently in terms of regulations on new and existing stock, to meet the net neutral, mid-century targets. Banks should consider this a major short-mid-term risk to collateral value and their balance sheets' credit profiles.

## Governments are already taking action...

The EU recently announced policies to make the 'Green New Deal' ambition a reality. The overall plan is to cut CO2 emissions by 55% by the year 2030. For the building sector its aims include:

- Part of the 72.2 billion euro spend (over 7 years) is earmarked for building renovation.
- A target of 49% of energy used in buildings to come from renewables by 2030.
- Member states must renovate at least 3% of public building floorspace annually.
- Member states must increase renewable energy in heating and cooling by at least 1.1% per year until 2030.

## Some standards exist...

Countries around the world, including the US, have already started using the International Green Construction Code (IGCC), which details sustainability standards and certifications that are applied to high- and low-rise buildings. These standards cover a wide range of topics including:

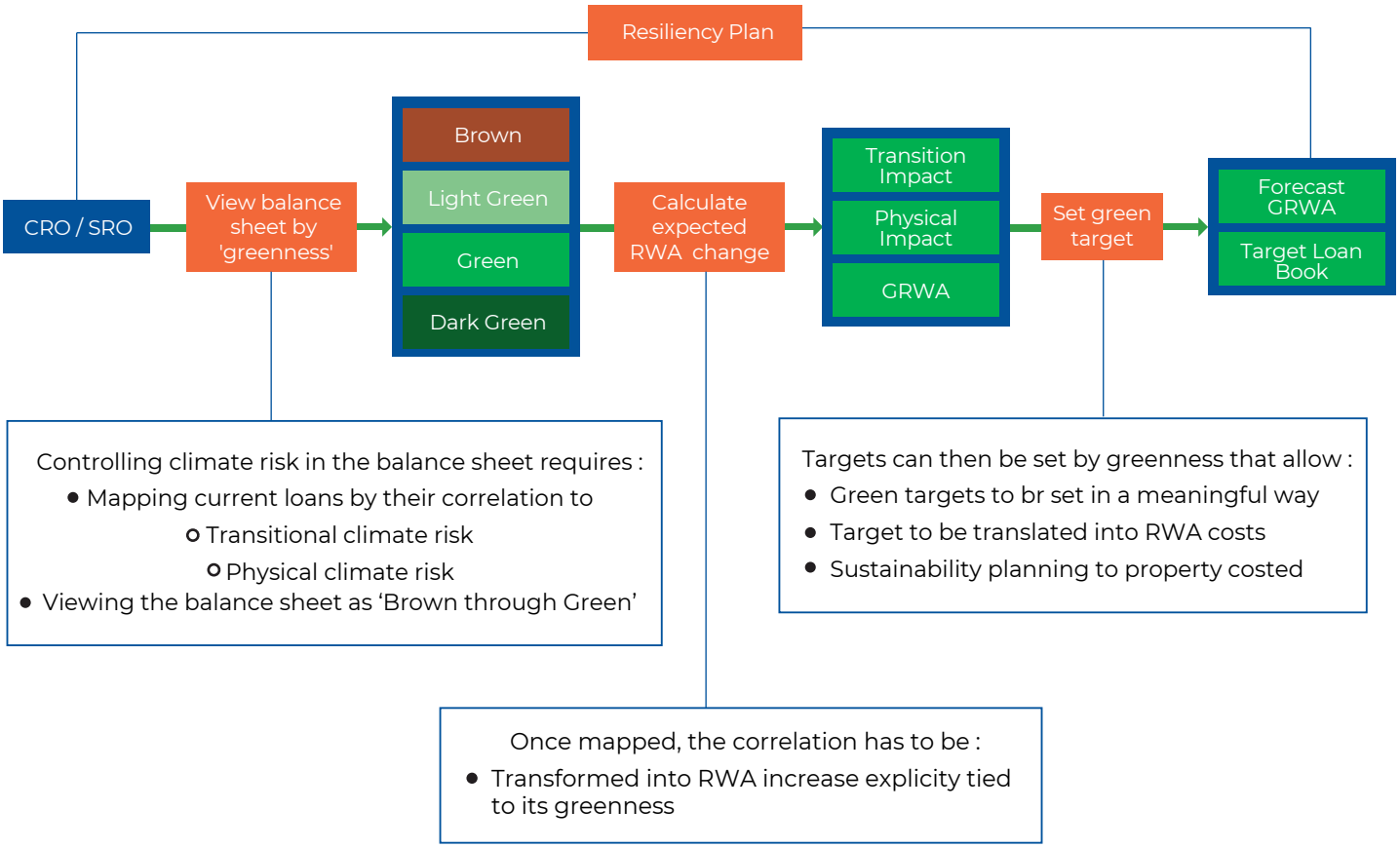
- Sustainable sites
- Energy efficiency
- Water efficiency
- Materials and resource use
- Indoor environmental quality
- Greenhouse gas emissions
- Operations and maintenance

These standards apply equally to new builds, additions, and renovations. Effectively, buildings can be assessed from a bottom-up perspective using this code in the same way that the overall built environment can be assessed from a top-down perspective using the IEA reporting. These twin perspectives would enable banks to form a view of the size and cost of the overall risk, as well as to be able to accurately judge their own exposure to that risk.

## Banks must be active during the transition...

The banking system will be at the center of this green transition. The need for private finance, coupled with the need for builders and owners to comply with new and upcoming regulations implied that property values may be quite volatile. This pressure imposed on those building firms and owners will translate into balance sheet credit changes and capital provisions for banks. At the very least, banks must:

- Be familiar with the changing regulatory landscape in the building sector.
- Understand the impact on their current balance sheet.
- Be prepared to work with and encourage customers to adopt sustainable building practices.
- Price credit facilities and loans accurately to reflect the risk from climate change and policies designed to combat it.
- Create short-, mid-, and long-term strategies to manage the climate change risk along with their customers.




Greencap is designed to translate the real-world risks of physical and transitional climate change into a meaningful financial impact on banks and their balance sheet/profitability. It is intended to be a base for setting sustainability strategies and working directly with customers to achieve an economically viable, greener future.

## Chapter 6

# BANKS RISK BECOMING A WEAK LINK IN THE GREENING OF SUPPLY CHAINS

### NEW AND AGILE RISK MANAGEMENT STRATEGIES ARE REQUIRED TO MITIGATE THE FINANCIAL IMPACT OF CLIMATE CHANGE

Originally published on October 25, 2021

## Banks will witness a dramatic shift in risk management in the coming decade...

Climate change is now forcing them to reassess the way they measure credit risk, specifically the way they incorporate the impact of climate change into their analysis.

There is a significant amount of climate-related analysis available to banks that covers core industries, from agriculture to power generation. Banks, however, need to look beyond the top-level analysis as they are exposed to the reverberant financial impact of climate change throughout entire supply chains.

## Banks offer numerous supply chain financing options...

From the increased globalization of supply chains to 'just in time' economics, the way the world economy links together has never been so complex. To reduce any friction, the financial system has developed a number of financing tools in response to that complexity.

## Traditional finance tools

- **Loans** - Normal commercial loans to support businesses.
- **Drawdown credit facilities** - Credit facilities pre-arranged to ease liquidity for firms through the general business cycle.
- **Letters of credit/guarantees** - Bank-banked assurances for specific payments made from the firm.
- **Margin accounts** - When firms hedge future inventory needs, banks provide credit facilities to pay margin calls as needed on behalf of the customer.

## Supply chain specific tools

- **Receivables discounting** - Outstanding invoices are sold at a discount to financial institutions in order to create cash injections, often to cover seasonal liquidity variances.
- **Forfaiting** - Banks advance cash to sellers against invoices. These are guaranteed by the buyer's bank.
- **Factoring** - Banks advance a percentage of invoices, with that percentage being based on the credit profile of both the seller and buyers involved.
- **Payables financing** - Banks provide the option to receive a discounted value of outstanding invoices, at a cost in line with the buyer's credit profile.

- **Loans against receivables** - Banks provide loans based on future receivables.
- **Distributor finance** - Banks provide liquidity for manufacturers to cover periods before sales are made.
- **Loans against inventories** - Banks provide loans for warehousing of goods that are either pre-sold or unsold.
- **Pre-shipment finance** - Banks provide financing against purchase orders and pre-agreed commercial contracts.

It is clear that banks are exposed to any disruption or sudden credit impact all along the supply chain. It is equally clear, from the science and analysis that climate change will cause just such disruption.

## Risk frameworks urgently need to include climate change...

Incorporating climate risk into a bank's risk framework and appetite is a challenge. In April, the Basel Committee on Banking Supervision (BCBS) published papers on both, the drivers of climate change related risk to banks, and emergent practices in the area. These papers are available here. What is clear from them is that credit risk associated with climate change is the principal concern for banks. This is justified as credit risk deterioration on the balance sheet will directly lead to higher RWA-based provision, and consequently to lower profitability and liquidity.

Two principal climate change effects will impact bank obligors:

**Physical impacts** - These are the disruptions to customers caused by the effects of physical climate change, from changing weather patterns to flooding and coastal erosion. All of these factors have, and will increasingly have, ramifications on global supply chains across all industrial sectors.

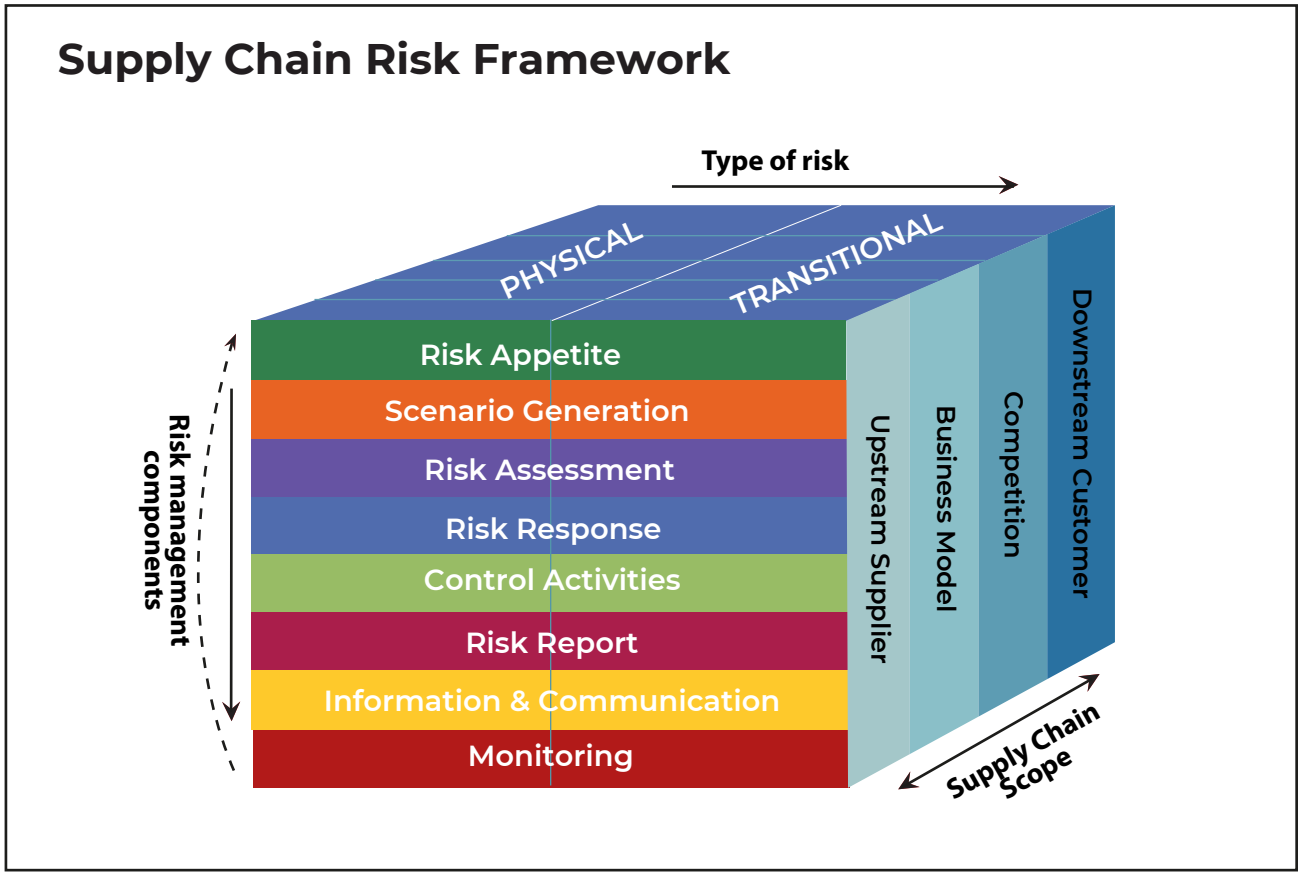
**Transitional impacts** - These are policies and measures taken by governments and regulators to curb climate change. They will cause huge disruptions to business flows, orphaning assets and even cause businesses to become unsustainable.

To effectively build these into existing risk frameworks means stress-testing the book against properly costed climate scenarios. This means utilizing scenarios created by the Intergovernmental Panel on Climate Change (IPCC) and costs determined by the Net Greening of the Financial System (NGFS). The difficulty starts when we have to decide on the costs that will indirectly impact customers throughout the supply chain. For this, we can refer to the research performed by the International Energy Agency (IEA), wherein the main impacts on key industries are detailed.

Ultimately, we have a new category of risk that allows us to categorize each obligor by its underlying industrial sector and apply a benchmark correlation to the overall loss, as predicted by the IPCC/NGFS/IEA research, by scenario. This, though, is only the beginning, as firms may:

- Take adaptive action to reposition themselves.
- Be impacted by both their downstream and upstream supply chains, with little control over them.

Banks will have to consider both these factors when it comes to increasing the accuracy of a specific firm's correlation to the impacts.

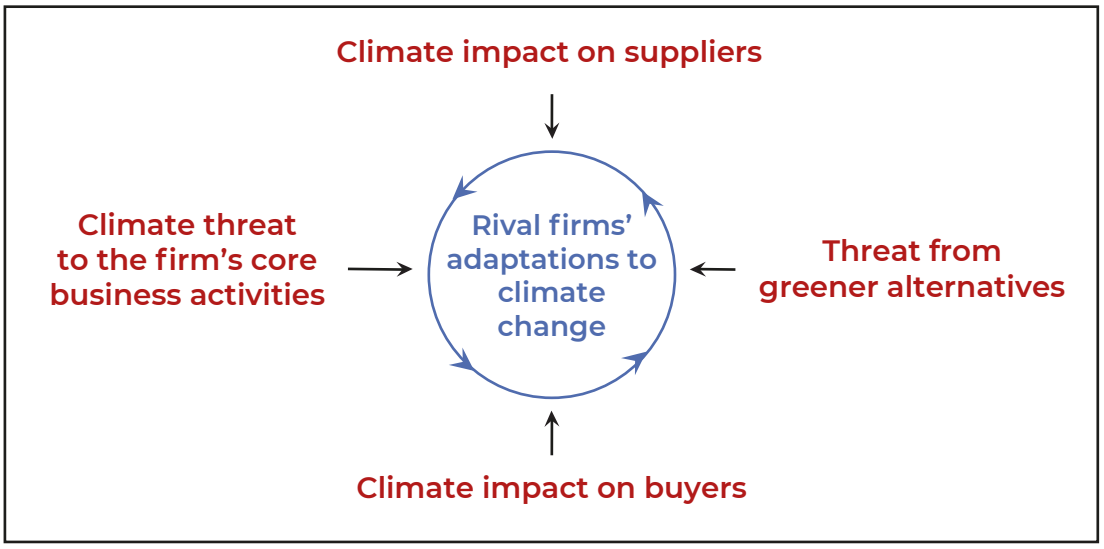



## Banks have a blueprint for detailed firm-specific risk analysis...

In order to analyze the impact of climate change on a firm, banks must return to a derivation of a familiar and accepted analysis model—Porter's Five Forces. The reason for this is that there is not a large data set of scenarios and known outcomes to base correlations on. Without that, there is a need for fundamental analysis with some climate specific changes.

## The forces that now need to be considered are:

- **Climate impact on suppliers** - Are the firm's suppliers likely to be impacted by physical climate change or mitigation policy?
- **Climate threat to the firm's core business activities** - Is climate change or policy likely to directly impact the client's assets and areas of business?
- **Rival firms' adaptations to climate change** - Are other firms in the same sector quicker to adapt to climate change?
- **Threat from greener alternatives** - Are alternatives that are more in line with the policies, public perception and physical reality of climate change, available?
- **Climate impact on buyers** - Can the firm still sell to its target market, or will climate change affect its buyers in such a way that the business model itself is unsustainable?




Using this analytic approach, banks can classify their books by loan in terms of the correlation of the obligor to the predicted loss arising from physical and transitional climate change. There is:

- A high-level loss across multiple sectors
- A benchmark loss by sector
- A scaled firm-level loss within each sector

This can also be used on new business to price climate-related effects into the credit facility effectively.

## GreenCap can help...

GreenCap is a ready-to-use system, designed to assist banks in categorizing and assessing loans according to their exposure to climate change risk. The system also enables banks to price, manage, and mitigate that risk. This category of financial risk is new and will grow as we move towards 2030. GreenCap aims to ensure that banks remain profitable and on the right side of history.

## Chapter 7

# BANKS NEED TO SQUARE THE CIRCULAR ECONOMY OR RISK SIGNIFICANT CREDIT LOSSES

MOVING TOWARDS A CIRCULAR ECONOMY IS CENTRAL TO FIGHTING CLIMATE CHANGE. THIS REPRESENTS RISKS AND OPPORTUNITIES FOR THE BANKING SECTOR.

Originally published on October 29, 2021

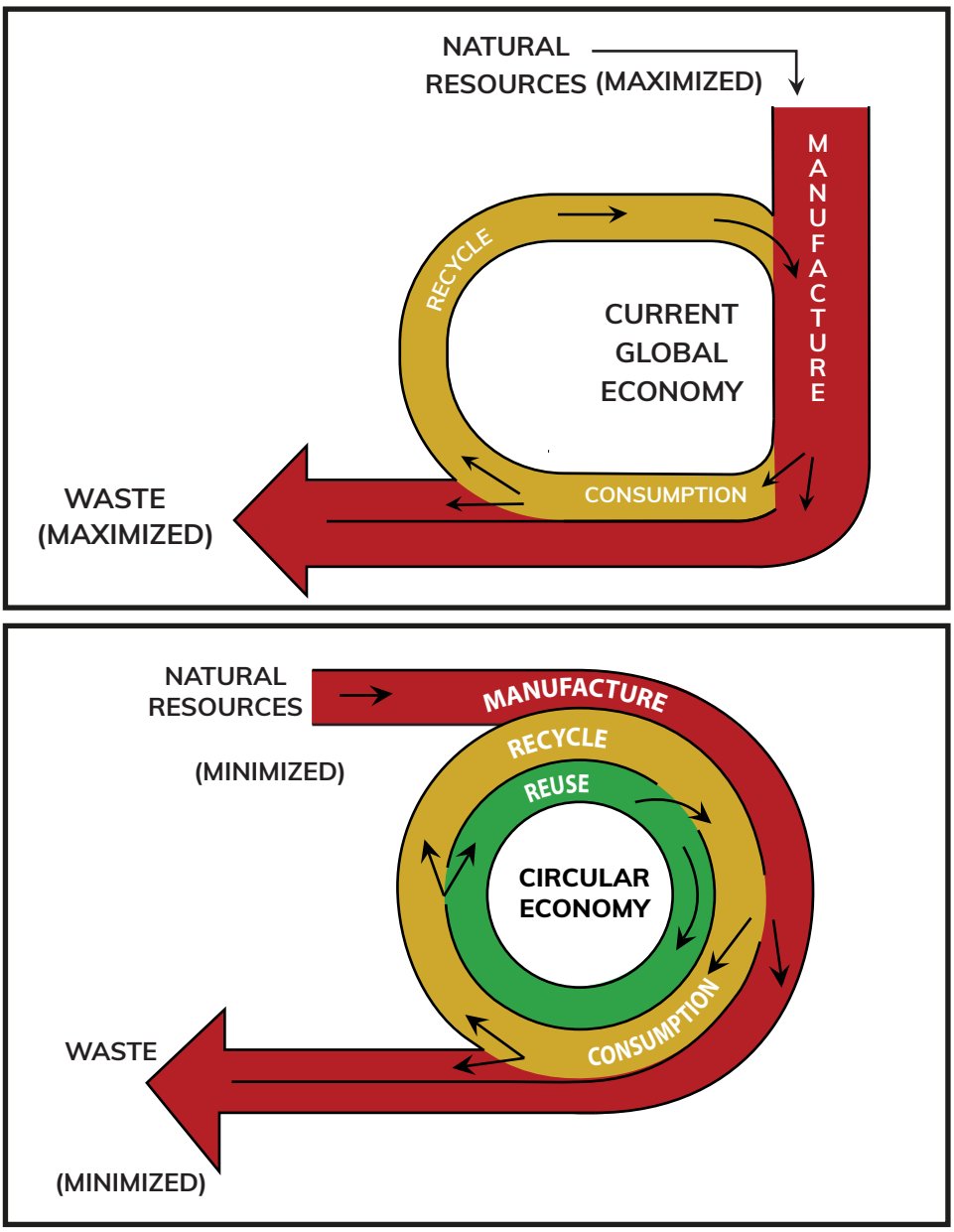
# Defining a circular economy...

The term circular economy is widely used within the discussion around addressing climate change. It has a specific place in the detailed plans of governments, such as the EU, as they are unveiled to make global economies more sustainable. The exact definition of a circular economy varies, but the World Economic Forum (WEF) defines it as:

"A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems, and business models."

In simpler terms, it can be read as:

- **Long term usefulness is built into product design** - Products should be designed to avoid waste, which means, they should be made in such a way, that;
  - They remain in use as designed
  - They are repurposed
  - They are recycled
- **Waste is eliminated** - Waste from industrial processes is often viewed as a necessary evil, but ought to be seen as a process failure. The following are to be specifically avoided;
  - Landfill creation
  - Oceanic pollution
  - Global shipping of waste, including recycling, between jurisdictions
- **Biosphere regeneration** - By keeping existing goods in circulation for a longer period, it is possible to;
  - Allow forests to recover and act as natural carbon sinks
  - Prevent plastic in oceans from breaking down into methane and ethylene, both of which accelerate global warming




## Creation of a circular economy...

The Ellen McArthur Foundation is committed to establishing a circular economy and has published a set of guidelines for policy makers to achieve that goal. Suggestions from them include:

**Stimulate design for a circular economy** - Product policies, building regulations, agricultural land-use, food policies, and international standards, all can accelerate the transition to ensuring that what is placed in the market is designed with a circular economy as the ultimate goal.

**Manage resources to preserve value** - Policies that incentivize collection, separation, and sorting systems that can support reuse, sharing, repair, and remanufacturing of products, in addition to high-quality recycling and treatment systems, such as composting and anaerobic digestion.

**Make the economics work** - Aligning taxation, subsidies, state aid and government funds, competition, labor and trade policies, as well as procurement, disclosure, and accounting requirements, with circular economy principles.

**Invest in innovation, infrastructure, and skills** - Targeted public investments in transformative business models, product, and material innovation, as well as physical and digital infrastructure, are all requirements of a circular economy.

**Collaborate for system change** - Establishing alignment and harmonization nationally and internationally is key, as is the development of processes that are inclusive and additive to the overall value chain, and which provide policymakers with the feedback they need.
*ref: Ellen MacArthur Foundation, Universal Circular Economy Policy Goals (2021)*

From the above it is clear that, for a circular economy to be established, a significant government willingness to invest, subsidize and legislate, is needed.

## Governments are adopting circular economy thinking...

The EU adopted the Circular Economy Action Plan (CEAP) in 2020 and it is a focal point in the bloc's Green New Deal. Its stated aims are:

- Make sustainable products the norm in the EU.
- Empower consumers and public buyers.
- Focus on the sectors that use most resources and where the potential for circularity is high such as - electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water, and nutrients.
- Ensure less waste is generated.
- Make circularity work for people, regions, and cities.
- Lead global efforts in building a circular economy.

These aims are backed up by a 35-point initiative tracking plan that can be read here. Industries within the region can expect regulatory pressure to mount over the next few years, particularly as the EU has increased its CO2 reduction target to 55% by 2030.

The UK, following its exit from the EU, also announced a similar package, 'The Circular Economy Package', in 2020. The US and Canada have both been called on by the UN (speech - North America and the Circularity Transition), to lead the world in its move towards sustainability, with Phoenix and Toronto being praised for their efforts towards a circular economy. More policy is expected to come from both countries.

# Financial industry needs to understand circular economics...

As is generally the case with climate change initiatives and goals, implementation is a mix of direct government action, subsidy, and regulation. The impact of the move to a circular economy will be felt by existing businesses and new projects alike, as adaptation costs and stranded assets significantly change the business projections and credit profiles of firms across all sectors. It will also create new opportunities for innovation and replacement businesses, better suited to regulatory frameworks.

Banks have to examine their own exposures and ensure that loans and credit facilities are priced for the known and expected changes to businesses they finance. At a minimum, this entails:

- Understanding current and forthcoming regulations that impact businesses they already provide credit to.
- Anticipating likely future regulations that may 'strand' assets and projects.
- Pricing credit to incorporate these costs and to encourage circular design.

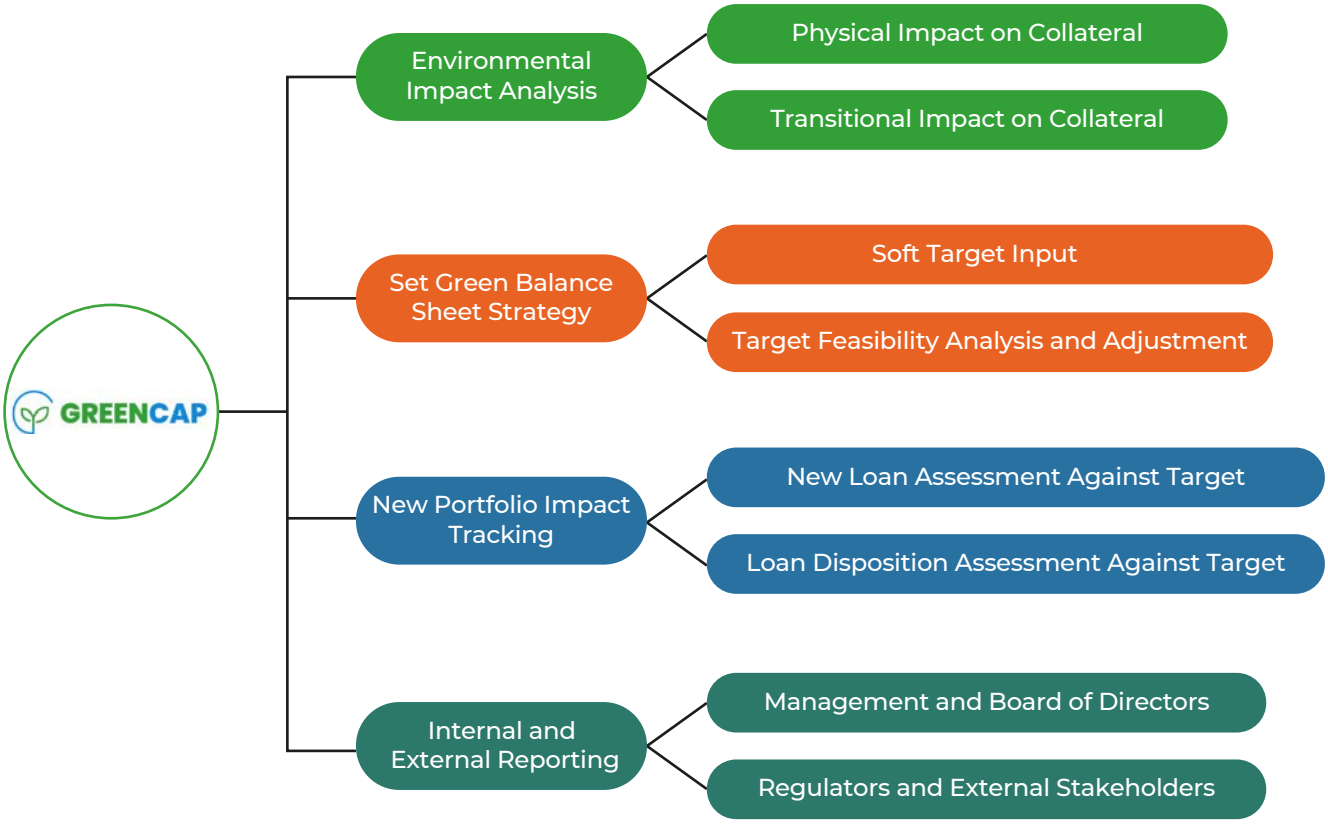
Where policies are already published or enshrined into law, this can be seen as normal 'due diligence'. However, for future policies, banks will have to create scenarios and associated costs to calculate the likely impacts on their balance sheets.

It is important to note that this type of credit price analysis is related, but separate to emissions reporting. Scope 1, 2 and 3 emissions are useful audits of CO2 being financed, but barely touch the breadth of sustainability related impacts that a full move to a circular economy would represent. From Methane, through waste disposal, to agricultural land use, every section of the economy will be affected, and as such, banks have to be cognizant of the risks and opportunities being created.

## GreenCap can help...

GreenCap is a system designed to assist banks in:

- Analyzing their balance sheet from the perspective of increased risk from physical and transitional climate change.
- Creating strategies to achieve a greener balance sheet in a way that can be planned, monitored and reported.
- Work with customers to turn 'sustainability in design' into a direct reduction in the cost of their credit facilities.




GreenCap aims to capture the entire cost of climate change risk, and therefore, provide banks with a full picture of challenges and opportunities of the next decade and beyond.

## Chapter 8

# BANKS NEED TO TREAD CAREFULLY AFTER COP26, WHEN STARTING THEIR SUSTAINABILITY JOURNEY

### PATHWAYS AND PROMISES OFTEN FAIL TO BECOME POLICIES. AFTER GLASGOW, BANKS WILL HAVE TO EXERCISE CAREFUL JUDGEMENT WHEN SELECTING TRANSITION SCENARIOS

Originally published on November 8, 2021

# Conference of the Parties in Glasgow (COP26) has a long lineage...

The United Nations Framework Convention on Climate Change (UNFCCC) was created in 1992 to fight 'dangerous human interference with the climate system'. The annual COP summits started in 1995, as a forum for the UNFCCC member countries' governments. The intention was to determine hard strategies aimed at limiting global warming to levels at which the catastrophic effects of climate change can be avoided.

While each COP is significant, there are three key points in the timeline that need to be highlighted from a policy indication perspective:

**COP3 - 1997 - Kyoto, Japan**
The Kyoto protocol established targets for the reduction of a range of greenhouse gases (GHGs) including—carbon dioxide (CO2), Methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). The protocol was designed based on 'common but differentiated' responsibilities. This effectively meant that more developed countries were responsible for achieving the agreed targets. The first commitment period ran from 2008 to 2012, with all targets being met by the 36 countries that carried them. It should be noted that 9 countries achieved their targets by funding GHG reduction overseas, and several of them failed to take on new targets for the second commitment period.

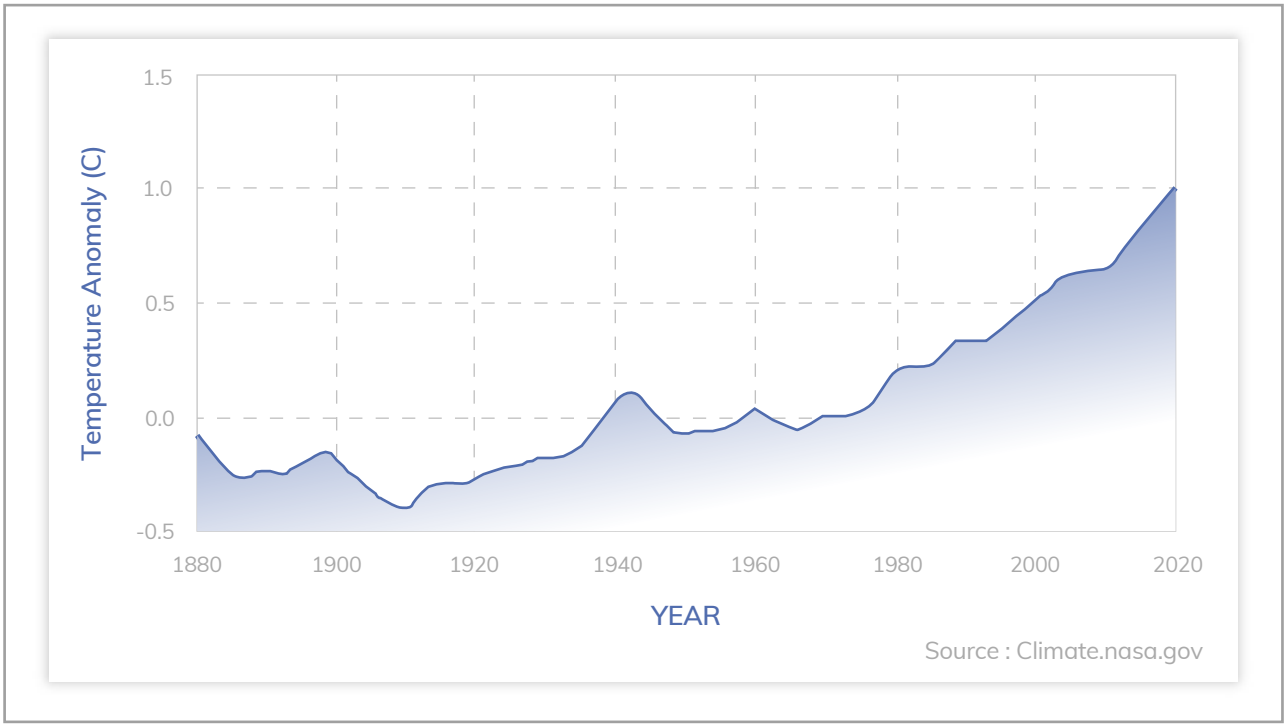
**COP15 - 2009 - Copenhagen, Denmark**
The summit in Copenhagen was intended to define the second commitment period, meaning that targets would be agreed upon, and concrete plans formulated, to hold global warming to 2 degrees above 1990 levels. This amount of heating is considered to be the level at which the worst impacts of climate change could be avoided. Ultimately, the conference ended with a non-binding agreement being 'taken note of', stating that actions should be taken to achieve the 2-degree limit. No actual GHG targets were set or agreed upon.

**COP21 - 2015 - Paris, France**
The Paris edition saw a change in direction in the global climate change response. Rather than hard targets being set by the UNFCCC, countries agreed to determine, set, monitor, and report on their own reduction targets. There was a stipulation that each target must go beyond the previous one. The accord applies to developed and under-developed countries. This agreement effectively separated the targets for each country (self-set) from the overall group's global warming aim of 2 degrees. It is important to point out that policies enacted to achieve compliance with the accord, are insufficient to meet the 2-degree warming limit.

These examples show that the UNFCCC and the COP series of summits most certainly look at the science and also accept that coordinated action is required. It is equally clear, though, that the transition targets and policies needed within that coordinated action are extremely difficult to agree upon by all.

## COP26 is held at a crucial moment...

Despite protocols, targets, and pledges, the last decade has been the warmest on record, and there has been an alarming increase in both the number and intensity of extreme weather events. These events have included forest fires, floods, hurricanes, and heatwaves.




*Graph of annual temperature relative to 1951-1980 average*

The undisputed scientific view is that GHG reduction has to accelerate to achieve:

- 2-degree global warming limit by 2100
- Carbon neutrality (net zero) by 2050

To reach carbon neutrality by 2050, policies and regulations need to be in place by 2030. This means that the conference in Glasgow must end with agreements across a range of areas including, but not limited to:

- Transition to electric vehicles
- Phasing out the use of fossil fuel
- Reforestation
- Oceanic pollution
- Agricultural practices
- Heating and cooling of buildings

Once these commitments are made, they also have to be ratified by the legislatures in the participating countries and followed by supporting policies.

## Timing is key to environmental policies...

The commitments required at COP26 are guided by scientific work undertaken by the Intergovernmental Panel for Climate Change (IPCC). This results in numerous pathways to achieve various levels of global warming abatement over the 21st century. The 2- and 1.5-degree pathways detail the amount of GHGs that need to be cut and by when, to hold the world to the levels aimed at and committed to (1.5 degrees is an aim, while 2 degrees is a commitment). The most significant part of the pathway is the first decade, to 2030.

Governments can choose to undergo the green transition at whatever speed they like, but environmental economists refer to two distinct rates:

- **Orderly** - This refers to planning the transition, announcing policies, and managing the expected disruption in a way that avoids economic collapse in specific geographic areas.

- **Disorderly** - This refers to leaving policy-making until the latter part of the 2020s when dramatic changes would need to be implemented quickly to meet the GHG reduction targets.

The Net Greening of the Financial System (NGFS) is a group of central banks and economists who put costs against the orderly and disorderly transitional pathways created by the IPCC, and as such, provide the base for industry-specific analysis.

## Banks must include policy speed in their stress testing...

Assuming that agreements are made and ratified, there will be a great deal of economic disruption over the next decade, due to this transition from a brown to a green global economy. Firms in all industries will be faced with onerous regulations that will severely impact their business models, profitability, and credit profiles.

Banks will be in the center of the transition, managing the investment flows and liquidity of both the outgoing economic model and the new, low GHG version. This role has to be fulfilled in the context of modern banking regulations; this means managing the resultant credit risks that such a wide-ranging economic switch will create.

Specifically, banks will need to:

- Analyze their current book of business to understand any additional credit risks it will face as the transition happens.

- Price new business appropriately to incorporate new regulations and adaptation costs that the underlying borrowers are facing.

- Stress test orderly and disorderly transitions to generate worst-case liquidity plans.

In many ways, this represents best practice risk management, simply applied to a new risk class—climate change.

## Scenario data is available...

As mentioned above, between the IPCC and the NGFS, costed scenarios exist and are used to guide policymakers at the COP summit. Additionally, the International Energy Agency (IEA) tracks the progress of various sectors, serving as an indicator as to whether we are looking at an orderly or disorderly transition.

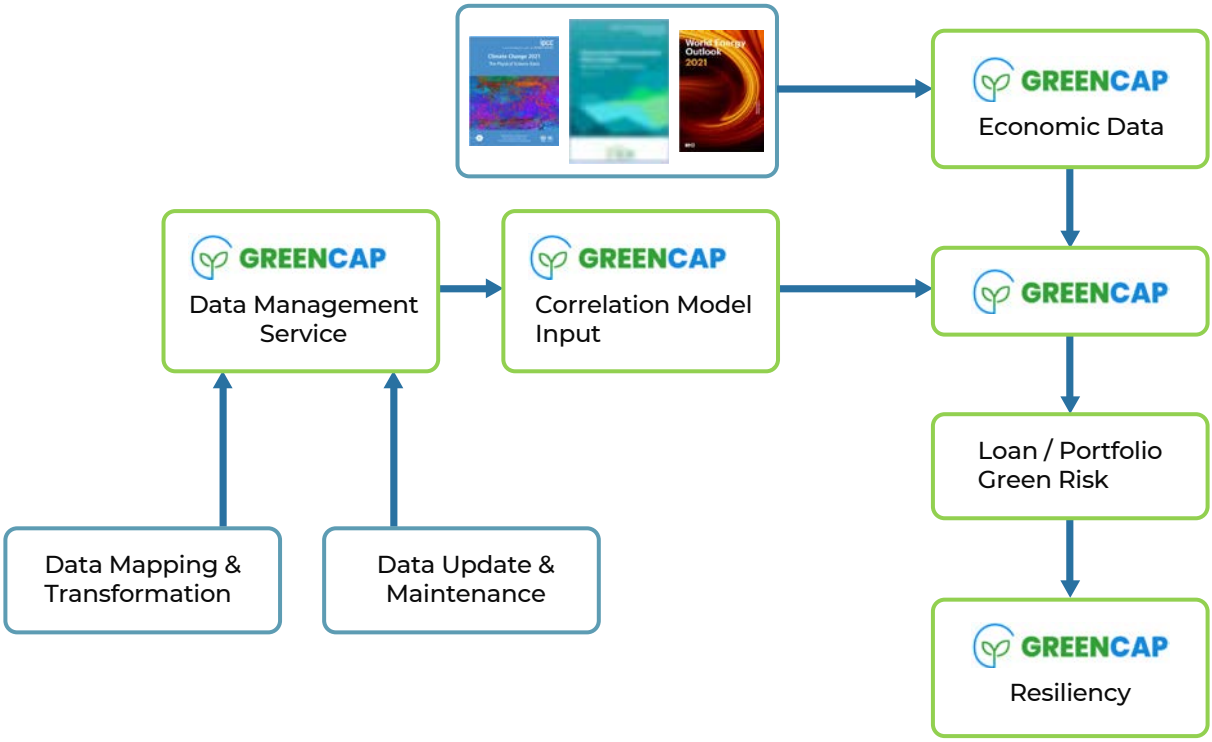
Using this data as the starting point, banks have to begin the work of constructing frameworks that can deal with climate change risks, and allow them to chart their transition course themselves. Without a full plan in place:

- Credit deterioration across brown industry borrowers will spike the (Risk Weighted Assets) RWA calculations, negatively affecting the bank profitability.
- Opportunities to fund green innovation will be lost.
- Liquidity stress tests will not include potentially devastating impacts of a disorderly transition, putting the bank itself at risk.

# GreenCap can help...

GreenCap is a risk system designed to analyze the credit impact of climate change on a bank's loan book.

The system maps data to the loan book, and calculates credit deterioration, and the increase in RWA. This is then used to calculate climate-related spread by facility and resiliency of the loan or balance sheet.




Working at loan through to full balance sheet level, GreenCap has functionality to help banks build finance-based advisories as well as long-term transition strategies that can be communicated to stakeholders and used as sustainability reporting metrics.

## Chapter 9

# 6 PRINCIPLES BANKS NEED TO ADOPT TO THRIVE IN THE UPCOMING GREEN ECONOMY

**WITH INCREASING CLARITY ON CLIMATE CHANGE, THE ROADMAP TO COMBAT IT IS EVER-EVOLVING. TO BE A PART OF THE SOLUTION, BANKS NEED TO ENCODE UN GUIDANCE ON RESPONSIBLE BANKING.**

Originally published on November 12, 2021

Governments around the world are making promises and commitments to limit global warming to 2 degrees (as measured against 1990 levels). Policies are being created to fulfill these promises but there is a huge funding gap that private finance must fill, measured in trillions of dollars. Banks will be the keystone in bridging it. The need to include climate change into risk frameworks of financial institutions is increasingly being accepted. Now, banks need a place to start their individual transformations.

To become an integral part of the climate solution, banks must do business in a way that upholds the spirit of the ongoing global changes, as well as align with the multitude of regulations they face locally. In 2019, to provide a framework for banks to build their future business plans, and as a part of their environmental program - 'Finance Initiative', the UN created 6 principles of responsible banking.

Before looking at them, it is important to understand what the UN defines as the goals that banks need to align with.

## The United Nations has a list of 17 Sustainable Development Goals (SDGs)...

The UN has an agenda to support their 2030 ambition. Each member of the organization has signed up to it. This ambition can be summarized as 17 SDGs that deal with a range of interconnected issues, from poverty to climate change. The full list of SDGs is as follows:

1. End poverty in all its forms, everywhere.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. *Ensure availability and sustainable management of water and sanitation for all.*
7. *Ensure access to affordable, reliable, sustainable, and modern energy for all.*
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. *Build resilient infrastructure, promote inclusive, and sustainable industrialization and foster innovation.*
10. Reduce inequality within and among countries.
11. *Make cities and human settlements inclusive, safe, resilient, and sustainable.*
12. *Ensure sustainable consumption and production patterns.*
13. *Take urgent action to combat climate change and its impacts.*
14. *Conserve and sustainably use the oceans, seas and marine resources for sustainable development.*

15. *Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.*
16. Promote peaceful and inclusive societies for sustainable development, provide access for justice for all and build effective, accountable, and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

While not all SDGs directly address climate change, almost half (highlighted in italics above), are highly correlated with the issue. Aligning with these is an essential part of the definition of responsible banking.

## The 6 principles of responsible banking are laid out by the UN...

The guidance is detailed in 3 papers:

- The principles signature document
- The key steps to be implemented by signatories
- The reporting and self-assessment template

Together, these papers make up the Responsible Banking Framework, which has been signed up to, by 250 of the largest financial institutions, globally. The 6 principles themselves are built around the SDGs of the UN. This becomes evident as they are explored.

**Principle 1 - Alignment**

*"We will align our business strategy to be consistent with, and contribute to individual needs and society's goals, as expressed in the SDGs, the Paris Climate Agreement, and relevant national and regional frameworks."*

Each bank needs to select one or more of the SDGs. Once chosen by the bank, these should be built into the business plan in a way that management can monitor and enforce. This means:

- Identifying and correcting misalignments
- Building SDGs into mid- and long-term strategies

In terms of sustainability, the most obvious course correction would be to move the balance sheet towards businesses that are directly supportive of SDGs that specifically focus on climate change mitigation and adaptation. This does require a mechanism to properly quantify that correlation.

**Principle 2 - Impact and target-setting**

*"We will continuously increase our positive impacts while reducing the negative impacts on, and managing the risks to people and environment resulting from our activities, products, and services. To this end, we will set and publish targets where we can have the most significant impacts."*

Essentially this principle directs banks to commit to responsible banking by actively setting targets against specific SDGs, and then monitoring and reporting their progress to management and external stakeholders.

The problem that banks face is that any targets in this area have to fit within existing regulatory reporting and accounting frameworks. These frameworks expect risks to be measured in specified ways, and capital to be set aside against them.

**Principle 3 - Clients and customers**

*"We will work responsibly with our clients and our customers to encourage sustainable practices and enable economic activities that create shared prosperity for current and future generations."*

This speaks directly to the role of banks as 'agents of change'. Banks are in a unique position to work with and incentivize corporate borrowers in a way that rewards sustainable business activities through lower borrowing rates. This should be the case as alignment with an SDG is also alignment with government aims, and therefore the expected policy. Assuming that policy follows commitment to an aim, businesses within the impacted sectors should experience an economic environment that becomes increasingly benign, as those policies move through legislation. Banks can price this expected future state into the borrowing rate for the loan.

This principle requires an understanding of the underlying business and likely direction of future climate policy. Banks can be valuable advisors as well as business partners in this area, making this principle one that is not only built into strategy but arguably defines it.

**Principle 4 - Stakeholders**
*"We will proactively and responsibly consult, engage, and partner with relevant stakeholders to achieve society's goals."*

This principle expects banks to use qualified third parties to ensure that their knowledge of the SDGs and firms impacted by them is as complete as possible. Activity in terms of advisory, target-setting, and strategy alignment should be based on the best possible information in the area of climate change transition, and adaptation.

**Principle 5 - Governance and culture**
*"We will implement our commitment to these principles through effective governance and a culture of responsible banking."*

This principle expects a bank to not only set targets that support specific SDGs, but make these targets a core part of management reporting and concern. This top-down approach must also be augmented by empowering, if not encouraging, a bottom-up approach of meeting these targets on a loan-by-loan basis. Cultural change requires a whole-bank approach to the goal.

**Principle 6 - Transparency and accountability**
*"We will periodically review our individual and collective implementation of these principles and be transparent about, and accountable for our positive, and negative, impacts to society's goals."*

This principle calls on banks to make their sustainability targets public, report on progress against them, and be fully transparent to external stakeholders about how the goals are being achieved.

These principles can be viewed as extending an existing risk management framework towards the area of climate change and sustainability. There are specificities in adopting the principles, requiring metrics and KPIs to be defined against SDGs. These principles should act as signposts to opportunities for banks to thrive in a greening economy, rather than as more 'red tape' to hamper growth.

## Banks need to be mindful of existing regulations...

Selecting SDGs and setting targets can be misleadingly simple. Since the 2008 crisis, a series of regulations have been imposed on banks from liquidity stress testing to IFRS9/CECL accounting standards. These require them to hold significantly more capital in High Quality Liquid Assets (HQLA) to cover credit risks that may materialize in the future. If proper planning is not applied to SDG selection or target-setting, the bank may find itself financing activities that are seen as speculative or risky. Increasing risk in this way would lock up capital and ultimately decrease profitability.

This can be avoided by simultaneously applying a forward-looking credit risk approach, to the greening of the world economy, and actively adjusting risk weightings to reflect the most likely future economic conditions. A forward-looking credit approach to climate change

takes more time to implement, but ultimately creates a truly sustainable business model and strategy that puts the bank firmly on the right side of history.

## GreenCap can help...

GreenCap is a risk system that is purpose-built to:

- Assist banks in creating and monitoring sustainability targets.
- Bridge the gap between traditional banking credit risk measures and climate change risk management.
- Enable banks to work directly with customers to incentivize sustainable business practices.

| Situation | Risk Gaps | GREENCAP |
|---|---|---|
| Science is settled on climate change | Stress tests for environmental impact | Include 'known-unknown' climate risk |
| IPCC/NGFS create sustainable pathways | Risk costed sustainability planning | Multiple climate / economic scenarios |
| Corporate ESG analysis available | Pre-deal climate risk analysis | Breakdown of expected capital increases |
| Governments creating ESG policy | | Target setting, reporting and monitoring |
| Banks facing with key risk questions / gaps | | |

Using GreenCap as the risk engine, banks can adopt the UN's principles of responsible banking, and create opportunities to finance a sustainable future for themselves and their customers.

Chapter 10

# COP26 IS IN THE BOOKS AND HAS LEFT STRONG SIGNALS FOR BANKS TO FOLLOW

AMID COMPROMISES, DISPUTES, AND CELEBRATIONS, THE GLASGOW SUMMIT HAS LAID DOWN STRONG MARKERS FOR THE FINANCIAL INDUSTRY TO UTILIZE, AS BANKS PREPARE FOR THE CLIMATE CHALLENGE.

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## COP26 - A Report Card For The Paris Accord Commitments...

There was considerable concern when heading into the summit. Climate policies were already implemented, notably across Europe, but many Paris pledges were yet to be fulfilled. Therefore, a far more aggressive agenda would be required to create an environment that would limit global warming to 2 degrees.

The six years between the Paris and Glasgow COPs, have seen the science become increasingly certain about the extent of the potential damage, with a greater urgency developing around the exponential increase in the risk above 2 degrees. All Paris accord commitments, assuming their fulfillment, would only limit the heat rise to 2.7 degrees above 1990 levels.

Additionally, the science of climate change states that any CO2 that enters the atmosphere lasts for centuries. Consequently, the 1.1-degree increase already observed, and all of its associated effects are here to stay. This means that adaptation to climate change is as important as mitigation. In fact, for a considerable part of the world, mainly smaller nations, adaptation is by far the most important element in their fight against climate change. In that context, the failure by developed countries to make good on their $100 billion a year development funding, promised in the 2009 COP, is one of the most damaging results. The under-developed countries at Glasgow were keen that this was addressed as a matter of utmost urgency.

Developed countries were looking for stronger commitments on fossil fuel phase-out. Pledges on this topic are highly contentious as the arguments about which nations owe compensation, which ones caused the most pollution, and which ones will be left out of a ‘just’ transition, are all unavoidable in the debate.

Finally, Paris succeeded because it had set a target for agreement on an overall goal (2-degree limit) with individual countries setting their own contribution targets, and policies. Glasgow was the COP where these targets were to be reported, assessed, and strengthened.

## Coal, Cars, Cash, Trees - A Rallying Cry for COP26...

The UK presidency began the summit with five high-level goals:

- Coal, used in steel manufacturing and power generation globally, was targeted with the aim of a timetable for a process to halt its usage entirely.
- Cars and the termination of manufacturing combustion engine vehicles were high on the agenda, following the UK's own decision to set a 2030 date for its cessation.
- Cash, which includes private finance, rectifying the deficit between the needs of the developing world, and funding provided by richer nations, was to be addressed.
- Trees were highlighted as science was concluding that the terrestrial carbon ‘sinks’ were close to becoming carbon emitters, due to deforestation. Turning that dangerous positive feedback loop around was a major goal.

- Keeping 1.5 alive became a secondary mantra for the COP. Effectively, each pledge and agreement was to be scrutinized under the magnifying glass of this ambition.

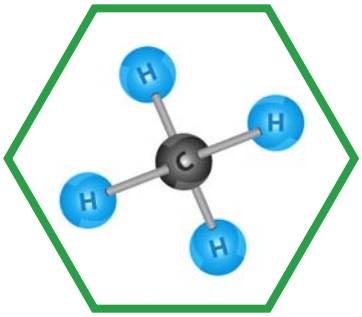
In short, the plan was to build on the consensus of Paris, creating specific structures and targets that would combine to meet the most ambitious limit to combat the increase in global temperature. If Paris decided on the journey's destination, then Glasgow was to determine the route.

## Some Expectations Were Cautiously Met...

Two weeks of negotiations proceeded in a predictable parade of announcements, pledges, protests, hopeful speeches, and hard negotiations. In the end, there was considerable progress made in several areas, including:

**Methane**

A US/EU-led global methane pledge was signed by more than 100 countries. The pledge aims to collectively reduce global methane emissions by 30% by 2030. This is important in the way it impacts the pathways to reach the final temperature levels. Methane survives for decades rather than centuries but is many times more potent as a heating gas while it is in the atmosphere. Reducing methane quickly flattens the time spent above the critical target temperature, thereby reducing the physical impacts that occur at that higher temperature. This was viewed as a major achievement of the summit, even though three of the largest emitters did not sign this pledge.




**Deforestation**

Possibly the most trumpeted win was the pledge to reverse deforestation, which notably included Brazil as a signatory.

**Coal**

The end of the second week was dominated by discussions over the wording of the agreement on coal that would be integral to the official COP document. The first proposal was, 'phasing out' coal from 2030. This was watered down to 'phasing out' without 'abatement', which meant that it would be alright to use coal as long as CO2 was collected at source. Ultimately, it became 'phasing down' in the final text. This was a disappointment but still represented the most significant movement on coal in any COP to date.

**Cash**

Private finance providers were present throughout the COP, with a key announcement of a $130 trillion alignment, by Mark Carney. The delegates also agreed on doubling funding to support developing nations' climate change adaptation. Skepticism is unavoidable about this commitment, after the failure of the 2009 promise, and the fact that it is not clear how such funding is provided. For smaller nations, the difference between loans and grants can be the difference between survival or mass migration.

**Annual Target Meetings**

It was noted that the criticality of the coming decade was not reflected by five-yearly intervals between progress reports and target revisits. Perhaps the most important outcome of all was the establishment of annual meetings for that purpose. These provide an opportunity to fine-tune the activity over the first 10 years, keeping the most desired consequence as a possibility.


**1.5**

Alive, but not looking good would be one description. 1.5 as a possibility does survive, but not because of any specific agreements. Rather, the ability to increase the ambition of each nation's targets annually, and the start that was made, means that there is a very narrow window of possibility of meeting that limit.

To conclude, COP26 met some of its initial goals and missed others, as is normal. The success, or otherwise, of the event as a whole, largely depends on perceptions and expectations at the start of the two weeks.

One unavoidable conclusion, though, is that the final agreement would still see a temperature rise of around 2.2 degrees. The only certain conclusion is that far more aggressive targets must be developed and applied in the short term.

## All COP Agreements Must Be Viewed By Banks, In Context...

Throughout our 'Code Red' series, this context has been financial impacts as predicted by:

- **Intergovernmental Panel on Climate Change (IPCC) -** The group of scientists who constantly reset the starting point and create pathways that would, if followed, achieve specific temperature rises by 2100.
- **Network for Greening the Financial System (NGFS) -** The group of central bankers and economists who put costs against the pathways relative to GDP, global and local.
- **International Energy Agency (IEA) -** The group that breaks down the impacts and costs by industry and tracks progress against them.

It is also imperative to decide whether the pathway being considered is:

- **Orderly -** A transition that begins quickly in the cycle, with a smooth path to its final objective, policy-wise.
- **Disorderly -** A transition that starts late, requiring additional stringent policies to be implemented without allowing impacted economies to adjust.

All agreements in the final COP document have to be viewed keeping the above in mind, as they are indicators to which pathways are likely to be followed, and the speed of transition.

Banks, in particular, will be stewarding most of the private sector capital through their balance sheets, into the fight against climate change. They must view the outcome of the summit extremely carefully, to determine which industries and firms are likely to represent a greater risk, as their business models are disrupted by environments created by the direction of climate policy. Conversely, there will be sectors and firms that are currently viewed as speculative but will eventually become mainstream, and therefore, less risky, as the pathway develops.

All this requires the development of a toolkit, specifically designed to measure climate change-related credit risks.

## Banks Need A Systematic Approach To Climate Risk Stress Testing...

Fundamentally, the climate risk to banks is one of liquidity, caused by high volatility in the credit risk of its loan book. As the post-2008 risk rules are applied (including the new forward-looking accounting standards and liquidity stress testing), banks must avoid a situation, where an economic switch from a brown to a green economy causes credit re-evaluation that effectively freezes the bank's capacity to do business.

In many ways, this mirrors best practice liquidity risk management and involves:

- **Determining The Most Likely Pathway -** The number of possible pathways to a specific target decline considerably as the time left to complete the transition reduces. Banks can use the IPCC/NGFS analysis to choose an 'expected' climate scenario.

- **Create A Model To Run The Climate Scenarios -** Any impact on the credit worthiness of a borrower that results from either physical or transitional climate change will directly impact how it is accounted for, on the balance sheet. By adjusting that calculation, banks can estimate the amount of excess capital they would need to hold in unproductive cash. This translates directly into an opportunity cost to the bank.

- **Create Applicable Scenarios To Run -** The bank now needs to apply the methodology to the book. At this point, it must run multiple relevant scenarios/pathways and specifically include the impact of an orderly/disorderly transition. Once run, the bank has an idea of the capital impact of each pathway.

- **Run Stressed Scenarios -** Similar to the Dodd-Frank Act Stress Testing (DFAST) or European Central Bank (ECB) liquidity stress testing, the bank must now run transition-specific scenarios to determine the point where liquidity issues become a crisis and threaten the institution's survival. This allows the bank to build climate change into its risk appetite.

- **Set Risk-Based 'Green' Targets -** To match its risk appetite, the bank must develop a series of short/mid-term targets where it can structure its loan book in a way that it can remain liquid and profitable, and fund the businesses that will actively benefit from the transition. This restructuring should align with the bank's public statements on sustainability, creating a virtuous spiral of sustainability and profitability.

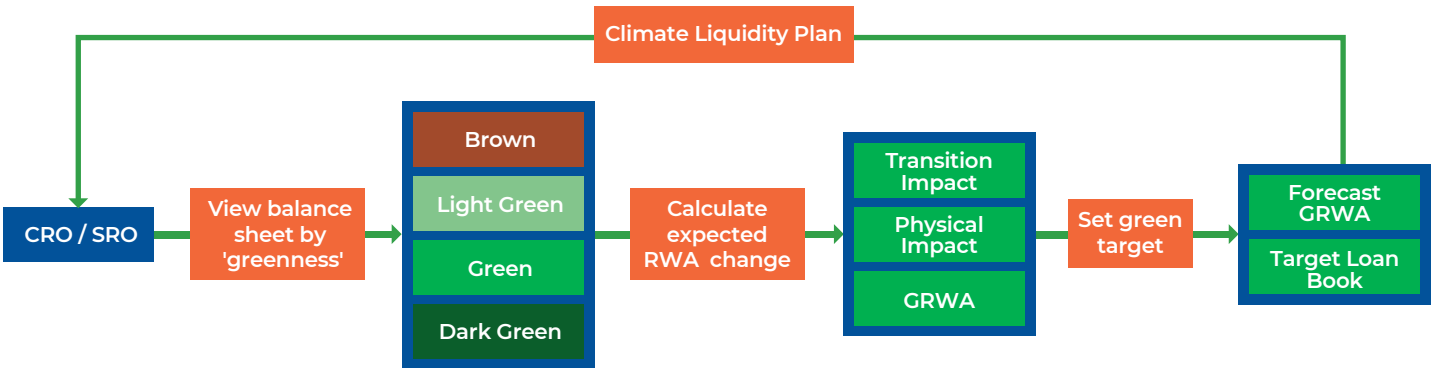
With the above in place, banks will have a climate risk policy that can be set, monitored, and reported against, and will support its sustainability goals, including potential adoption of the UN Responsible Banking code.

## GreenCap can help...

GreenCap is a ready-to-use system that adjusts credit pricing within the portfolio, from an individual loan to the entire balance sheet. Additionally, GreenCap will advise on scenario selection and individual loan adjustment through its sector-specific sustainability research.

Using GreenCap, banks can:

- Apply applicable scenarios and see the additional costs to the balance sheet that can be expected.
- Adjust individual loans to reflect firm-specific adaptations or stranded assets.
- Toggle the specific impact of transition policy and physical climate change.
- Create target loan book strategies and work out the final climate risk cost of each.




GreenCap was conceived with banks in mind and developed to specifically enable them to navigate the coming decade of economic upheaval as smoothly as possible. Banks must remain viable while fulfilling their vital role as gatekeepers and managers of private sector finance that is central to any chance of preventing the worst impacts of climate change.

Visit greencap.live for the full series of 'Code Red' insights, as well as news and resources, curated to assist banks in their sustainability journey.


## 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 400 employees with a global footprint. Our production and management teams are in the U.S, 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 SÜD South Asia, GreenPoint rigorously complies with ISO 9001:2015 and ISO 27001:2013 standards.
- GreenPoint is owned by its founders and principals and is debt free.

## Marcus Cree

MANAGING DIRECTOR AND
CO-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 studing Pure Mathematics, Phycology 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 is the Founder and Chairman of GreenPoint Global - a risk advisory, education, and technology services firm headquartered in New York. Founded in 2006, GreenPoint has grown to over 380 employees with a global footprint and production and management teams located here in the U.S, India and Israel.

During 2007-16 Sanjay was the Chief Risk Officer of Global Arbitrage and Trading Group and Managing Director in Fixed Income and Currencies Risk Management at RBC Capital Markets in New York. His career in the financial services industry spans over two decades during which he has held investment banking and risk management positions at 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" (RiskBooks,2018).

Sanjay was the Founding Director of the RBC/Hass Fellowship Program at the University of California at Berkeley and is an Adjunct Professor at EDHEC, Nice in France. Sanjay is also Adjunct Professor at Fordham University where he teaches a similar master's capstone course and at Columbia University. He has served as an advisor and a member of the Board of Directors of UPS Capital (a Division of UPS) and is a frequent speaker at industry conferences and at universities. He served on the Global Board of Directors for Professional Risk International Association (PRMIA).

He 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. Sanjay acquired his appreciation for risk firsthand as a merchant marine officer at sea where he served for seven years and received the Cheif Engineer's certificate of competency for ocean-going merchant ships. Sanjay lives in Rye, NY with his wife and two teenage sons.