CLIMATE CHANCE

GLOBAL SYNTHESIS REPORT ON CLIMATE FINANCE 2022

FINANCE FOR TOMORROW
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DIRECTOR OF PUBLICATION
Ronan Dantec, *President of Climate Chance*
Thierry Déau, *President of Finance for Tomorrow*

COORDINATORS
Antoine Gillod, *Director of the Global Observatory on Non-State Climate Action, Climate Chance*
Pauline Becquey, *Director of Finance for Tomorrow*

AUTHORS
Martina Spriano, Sustainability & Climate Manager, Deloitte
Théo De Shutter, Sustainability & Climate Consultant, Deloitte
Pablo Gonzalez Uribe, Sustainability & Climate Consultant, Deloitte
Aurelien Vitet, Sustainability & Climate Consultant, Deloitte

EDITORIAL COMMITTEE
Pauline Becquey, Camille Buewaert, Marguerite Culot (Finance for Tomorrow); Pierre Ducret (member of Climate Chance); Antoine Gillod (Climate Chance) ; Maria Scolan (Caisse des Dépôts); Martina Spriano, Pablo González Uribe, Aurélien Vitet (Deloitte)

ENGLISH TRANSLATION
Rachel Zerner
Tania Martha Thomas

GRAPHIC CREATION AND LAYOUT
Elaine Guillemot LATELIERDELESTUAIRE.COM
Hewan Goethals

PHOTO CREDITS
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Ronan Dantec
PRESIDENT OF
CLIMATE CHANCE
ASSOCIATION

With one year to go before the Global Stocktake, which will mark the first assessment of States' progress in implementing the Paris Agreement, this fourth edition of the Global Climate Finance Report produced by Climate Chance and Finance for Tomorrow is a major contribution to observing how far we have come in mobilising financial actors and instruments for the climate.

In this respect, this Report paints an ambivalent picture. Firstly, the observation that the objective of mobilising 100 billion dollars in annual climate finance from the countries of the Global North to the countries of the Global South has not been achieved by 2020. However, in a context of energy crisis and geopolitical tensions, international solidarity must more than ever be at the heart of mitigation and adaptation efforts. While emissions from the major emerging economies are rebounding faster than those from industrialised countries, this report also looks at initiatives outside the major OECD financial centres.

By making a massive commitment to the "net zero emissions" objective, the players are taking a further step towards aligning their portfolios and activities with the objectives of the Paris Agreement. It is precisely the role of the Observatory to take the necessary distance from these commitments in order to identify the concrete courses of action taken by the players to meet their objectives, and thus make the transition scenarios credible.

From this point of view, the rise of green finance instruments, from carbon offsets to green bonds, clearly shows the interest

In a context of energy crisis and geopolitical tensions, international solidarity must more than ever be at the heart of mitigation and adaptation efforts.

of financial actors in impact products. In this context, the harmonisation of rules to identify climate-friendly economic activities and the strengthening of ESG data transparency is imperative to gain the trust of stakeholders and ensure the integrity of investments. Europe, by adopting the only binding green taxonomy and the SFDR regulation on extra-financial transparency, is playing a leading role in this effort. The work of China, Singapore, ASEAN and South Africa on their taxonomies is also encouraging.

This year, the Global Climate Finance Report is changing to offer new reading formats that should make it possible to explore the *Trends* in finance flows in greater detail, to identify examples of noteworthy actions in *Case Studies*, and to perceive the *Signals* that indicate today the evolution of tomorrow's market. In this way, we hope to make a modest contribution to the monitoring of financial flows and practices which, in the years to come, will have to accelerate their switch to the service of the transition.

EDITORIALS

Thierry Déau
PRESIDENT OF FINANCE FOR TOMORROW

The challenge for finance no longer lies in the acknowledgement of its fundamental role in the ecological transition. Finance, by its very nature globalised, today and tomorrow, must serve climate objectives. The IPCC, in its latest report on solutions to climate change, nevertheless still identifies the financial sector as a bottleneck in the fight against global warming. The financial flows available on a global scale, although sufficient in volume to fill the investment gaps, still need to be massively redirected in favour of climate action.

The challenge for finance now lies in its capacity to support the ecological transition in order to make it an economic reality. The Climate Finance Report is therefore dedicated, year after year, to reporting on the actions already implemented and the solutions identified in the field of climate finance. I am delighted with this unique partnership between Finance for Tomorrow and Climate Chance, which allows us to establish a synthetic and global analysis of the major orientations of climate finance in order to enlighten all stakeholders.

For the year 2022, the Climate Finance Review is all the more crucial as the need to reduce our ecological footprint is increasingly pressing. In this context of ecological urgency, accentuated by the recent health crisis, the time has come not only to make commitments but to implement them. I am pleased to see that financial actors are committing themselves, for example, to the "Net-Zero" alliances, whose progress is monitored and published annually, or to the "Race to Zero" campaign, which brings together several categories of public and private actors, agreeing to align themselves, in the short and medium term, with science-based targets. In France, the *Observatoire de la Finance Durable* is a pioneer in monitoring the achievements of the Paris financial market on these issues.

Far from being alone, we are proud to be part of a global movement, and I hope that this report will contribute to supporting the dynamic of the full mobilisation of financial actors to concretely transform their practices in favour of a real economy in line with the objectives of the Paris Agreement.

The challenge for finance now lies in its capacity to support the ecological transition in order to make it an economic reality.

2020
2021

KEY FIGURES OF

General overview of financial flows

+10%
SINCE 2017-2018

$632 bn

CLIMATE FINANCE FLOWS IN 2019-2020

2.5%
$15 bn
MULTIPLE OBJECTIVES

90.1% - $571 bn - MITIGATION

7.3% - $46 bn - ADAPTATION

Although up by 53% compared to 2017-2018, finance flows for adaptation are still a long way from the equality targeted by the Paris Agreement and the $300 billion in needs estimated by CPI before 2030. While the share of private actors is increasing, public financing still accounts for 51% of adaptation finance.

Climate Policy Initiative, 2021

International North-South Finance

$83.3 bn IN 2020

CLIMATE FINANCE MOBILISED BY DEVELOPED COUNTRIES FOR GLOBAL SOUTH COUNTRIES

MOBILISATION TARGET OF $100 bn/YEAR

The $100 bn/year mobilisation target set at COP15 in Copenhagen for the year 2020 has not been reached.

OECD, 2021

International public finance for climate

in 2020

MULTILATERAL DEVELOPMENT BANKS

Joint Report on Multilateral Development Bank's Climate Finance, 2021

+6.5% COMPARED TO 2019

$66 bn

24% for adaptation

76% for mitigation

29% of the operations of multilateral development banks was directed to climate.

REGIONAL AND NATIONAL DEVELOPMENT BANKS

IDFC, 2021

-6% COMPARED TO 2019

$185 bn

+42% COMPARED TO 2019

$27,4 bn for adaptation

20% AS AGAINST 25% IN 2019

les financements verts représentent seulement 20%des engagements en 2020.

GREEN CLIMATE FUND

Green Climate Fund, 2022

+$3 bn IN 2021

$10 bn approved since 2015

190 projects financed

$2.3 bn disbursed

Transparency

3,960 supporters

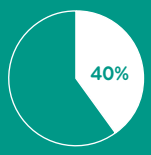
of which **1,539** financial institutions

SUPPORTERS OF THE TCFD RECOMMENDATIONS

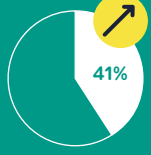
+32% BETWEEN 2021 AND 2022

Taskforce on Climate related Financial Disclosure, 2022

TCFD REPORTS OF ORGANISATIONS



40% of companies disclose on at least five (out of 11) of the TCFD's recommendations



COMPARED TO 28% IN 2020

The disclosure level of banks was 41% in 2021

COMPARED TO 34% IN 2020

The disclosure level of insurance companies was 41% in 2021

CLIMATE FINANCE

Asset managers and owners

ASSET MANAGERS
with a net zero commitment
The Net Zero Asset Managers initiative, 2022

273
signatories to the Net Zero Asset Managers Initiative

$61,300 bn
OF ASSETS MANAGED

ASSET OWNERS
with a net zero commitment
The Net Zero Asset Owner Alliance, 2022

74
signatories to the Net Zero Asset Owner Alliance

$10,600 bn
OF ASSETS HELD

0/30
Zero out of 30 of the asset managers surveyed by Reclaim-Finance have a fossil fuel reduction policy.
Reclaim Finance, Re:Common, Urgewald, The Sunrise Project, 2022

Commercial banks

COMMERCIAL BANKS
with a net zero commitment
UNEP FI, 2022

115
signatories to the Net Zero Banking Alliance

$70,000 bn
OF BANKING ASSETS

38%
of commercial bank assets in the world

FINANCE
for fossils fuels
Fossil Fuel Finance Report, 2022

$742 bn
of financing for fossil fuels by the 60 largest global banks in 2021

Second consecutive year of decline since the peak in 2019 ($830 bn)

Insurers

INSURERS
with a net zero commitment
UNEP FI, 2022

20
signatories to the Net Zero Insurance Alliance

$7,000 bn
OF ASSETS MANAGED

11%
of the total premiums paid worldwide

INSURED LOSSES
in 2021
Swiss Re, 2022

+30% COMPARED TO THE AVERAGE FOR 2010-2020

$112 bn
out of a total of $259 bn in economic losses

OF WHICH
$105 bn
natural disasters

OF WHICH
96.2%
climate-related

Green and sustainable financial products

GREEN, SOCIAL AND SUSTAINABILITY BONDS
Climate Bond Initiative, 2022

$1,100 bn **+46%** COMPARED TO 2020

of which, green bonds — IN 2021

$522.7 bn **+75%** COMPARED TO 2020

FINANCE

TREND
REGULATION

From China to Europe, taxonomies are increasing the transparency of financial markets

To guide investment decisions and capital allocation towards decarbonised or low greenhouse gas (GHG) emission activities, the world's major economic powers are strengthening their extra-financial regulations. In particular, recent years have witnessed a trend towards increased regulation associated with so-called 'green taxonomies', and more generally of the transparency of financial entities as regards their ESG practices. The new classifications of economic activities according to their environmental impact, whose aim is to prevent greenwashing and ensure better information about sustainable business for investors, have implications for both financial and extra-financial organisations.

DATA OVERVIEW

Green investments seek transparency in the midst of a booming market

From the sphere of economics to market finance, 'green' investments are riding high. Climate finance flows alone increased 10% between 2017-2018 and 2019-2020.[1] While the growth in climate finance slowed considerably during Covid-19 as compared to previous years (10%, versus 24% in previous bi-annual periods), the trend still leans towards an increase in these investments.

In this landscape, debt remains by far the most important climate investment vehicle (61%), far ahead of equity (33%) and non-repayable investment (6%). Indeed, more than $1.1 trillion in new green, social and sustainability (GSS+) bonds[a] were issued in 2021 (**Figure 1**). This represents a 46% jump in one year, bringing the total market volume to a cumulative $2.8 trillion, including $1.6 trillion of 'green' bonds. For 2021 alone, Climate Bonds has identified 2,089 new green bond instruments (+19% compared to 2020) from 839 issuers (+32%), for a total of $522.7 billion, up 75% year-on-year.[2] However, in a context of public suspicion regarding greenwashing, corroborated in some cases by scandals such as the

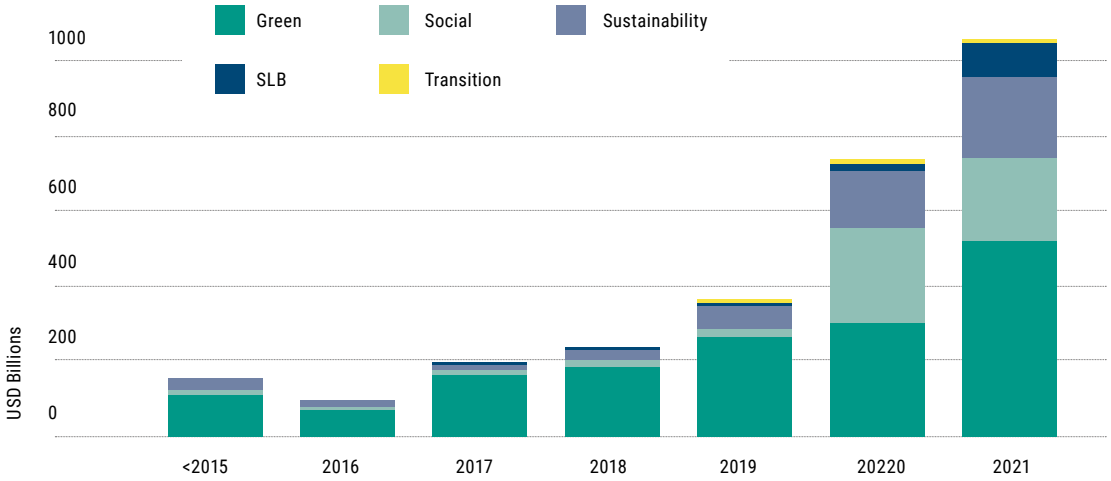
a Per the Climate Bonds methodology, debt instruments grouped under the GSS+ umbrella include a wide range of 'social', 'environmental', 'sustainability' (combining social and environmental benefits), 'sustainability-linked' and 'transition' bonds.

FINANCE

FIGURE 1

SOCIAL, ENVIRONMENTAL AND SUSTAINABLE DEBT VOLUMES TO EXCEED $1 TRILLION BY 2021

Source: Climate Bonds Initiative, 2022



abuses of German asset manager DWS (**see Signals**), what objective criteria can investors base their investment choices on, when their goal is supporting businesses with a positive environmental impact? How can the environmental properties of a financial asset be verified?

To orient investment decisions and capital allocations towards decarbonised or low greenhouse gas (GHG) emission activities, there has been a trend over the past two years towards strengthening the regulations governing so-called 'green' activities. For one thing, by adopting 'taxonomies', States are choosing to establish objective criteria for assessing the contribution of economic activities to their climate, environmental or social objectives. And for another, the transparency required of companies regarding their extra-financial activities is increasing, in part to facilitate investors' access to information on environmental, social and governance (ESG) performance.

THE OBSERVATORY'S LENS

Around the world, taxonomies are springing up to orient capital

China, an early adopter of green taxonomy

While the world's current leading contributor to global warming, with emissions exceeding 12.4 $GtCO_2e$ in 2021,[3] China is nonetheless a pioneer of green finance. Indeed, China is one of the first global players to have introduced regulation governing activities considered green. Work began in 2012, crafting key principles and performance indicators for green loans, and continued with the development of a catalogue of green bonds known as 'The Chinese Green Bond Taxonomy' in 2015. In 2016, guidelines for establishing a green financial system were published by the People's Bank of China (PBoC) in collaboration with seven ministries and commissions convened for this purpose.[4]

Standardisation of the country's green financial system was included in the PRC's 13th Five-Year Plan, covering 2016 to 2020. In 2018 and 2019, a working group developed a normative framework for green finance, the 'Guiding catalogue for the green industry' now used as a reference base for bond issues, green credits and the orientation of investment flows. The framework is organised into six main categories:

1. Energy efficiency and environmental protection
2. Clean production industry
3. Clean energy industry
4. Industry of ecology and environment
5. Green upgrade of infrastructure
6. Green services

In 2020, a new version was released for comment by the PBoC, the National Development and Reform Commission (NDRC) and the China Securities Regulatory Commission (CSRC), modifying the list of industries covered by green bonds. Among the changes made to meet the new 2060 carbon neutrality target and to comply with new international

standards are the elimination of clean uses of coal or fuel. In the coming years, CSRC Vice Chairman Fang Xinhai aims to introduce mandatory reporting for companies.[5]

The grand ambitions of the European taxonomy

In Europe, implementation of the Green Taxonomy adopted in 2020[6] started in early 2022. The EU Green Taxonomy is part of the 'Green Deal', the roadmap presented by the European Commission in 2019 to establish a green growth strategy for Europe covering the period 2021-2027. As of 1 January, 2022, more than 11,000 companies, financial institutions and EU Member States are subject to the European taxonomy. Currently, the companies concerned are those with more than 500 employees *and* a balance sheet exceeding €20 million or turnover over €40 million. These companies must indicate the proportion of their turnover, investments and expenditures that corresponds to sustainable activities. For 2024, along with the publication of a report on the year 2023, the threshold will be lowered to 250 employees while maintaining the same financial criteria.[7] This will increase the number of eligible companies to almost 50,000. The European taxonomy is currently the only legally binding taxonomy in the international arena.[8, 9]

From a global point of view, the European taxonomy covers more than 90 economic activities conducted in the European Union, classified according to three levels. The first level consists of 'sustainable' activities that are considered low-carbon and compatible with the Paris Agreement, such as renewable energy. The second level concerns so-called 'transitional' activities. These are businesses that contribute to transition towards a net-zero emissions economy in 2050. The third and final category covers the so-called 'enabling' activities, which make it possible to reduce emissions from other activities.[10,11]

To be regarded as 'sustainable', an activity must contribute substantially to at least one of the following six objectives, without significantly hindering any of the others:

1. Climate change mitigation
2. Adaptation to climate change
3. Sustainable use and protection of aquatic and marine resources
4. Transition to a circular economy
5. Pollution control
6. Protection and restoration of biodiversity and ecosystems

In addition, 'sustainable' activities must respect a number of principles related to human rights and labour law as established by the OECD, the International Labour Organisation, the United Nations' Guiding Principles on Business and Human Rights, and the Universal Declaration of Human Rights.

An activity is considered 'transitional' if there are no economically or technologically viable low-carbon alternatives. Such businesses may also be judged to contribute substantially to climate change mitigation if and when they meet the following criteria:

- Exhibit greenhouse gas emission levels in line with the best performances of the sector or industry
- Do not impede the development or deployment of low-carbon alternatives
- Do not to lead to a lock-in of carbon-intensive assets given the economic life of these assets

Thus, it is complicated to precisely quantify the number of activities that can be categorised as 'sustainable'. To take an example, the impact of an economic activity on biodiversity can vary significantly depending on where it takes place. To address this, thresholds have been set to better guide the classification of activities. For instance, a hydroelectric power plant cannot be considered 'sustainable' if its emissions exceed 100 gCO_2e/kWh over its lifecycle.

- And lastly, 'enabling' activities may be deemed to have a substantial contribution when the business in question:
- Does not result in lock-in to an asset type that would compromise long-term environmental objectives
- Generates a significant positive environmental impact over its full lifecycle

For example, wind turbine or solar panel factories can be considered 'enabling' activities, as they make possible the development of an activity classified as 'sustainable', i.e., the production of renewable electricity. In total, there are 21 activities classified as 'transitional' and 24 classified as 'enabling'.

The categorisation of certain activities is far from unanimous among member States and observers. In particular, each of the six objectives listed above has been further specified by 'technical screening criteria', the negotiation of which was the subject of fierce opposition and intense lobbying campaigns.

These criteria, established by a special body of the European Commission, define the particular conditions under which an economic activity can be considered 'sustainable' by the taxonomy. The most contentious debates have revolved around the categorisation of nuclear and gas. In February 2022, after years of tough negotiations, the European Commission finally adopted a complementary Delegated Act on the climate component (CCDA) of the European taxonomy, which complemented the first Delegated Act adopted in June 2021.[12] The CCDA clarifies the technical review criteria for gas and nuclear.

For gas-fired power generation, high-efficiency cogeneration of heat/cold and electricity from gas, and gas-fired heat/cold generation in an efficient district heating and cooling system, lifecycle emissions must not exceed 100 gCO_2e/kWh. In practice, this means that operators will have to use complementary measures, such as CO_2 capture and storage (CCS). According to UNECE, a gas-fired combined cycle power plant normally produces between 403 and 513 gCO_2e/kWh, compared to between 92 and 220 gCO_2e/kWh when CCS is used.[13] Additional criteria are set to ensure that gas plant can only replace more emissions-intensive installations (e.g., coal-fired plants). As regards nuclear activities, the Commission has included in the taxonomy the research and development of 4th generation plants, the construction and operation of 3rd generation plants until 2045, and extensions to the life of existing plants (until 2040). Safety and security criteria are added, as well as a ban on the export of radioactive waste outside the EU.[14]

In July 2022, the European Parliament finally voted not oppose the inclusion of nuclear and gas activities in the list of 'sustainable' activities. If the European Council does not veto, the delegated act on taxonomy will enter into force on 1 January 2023, and will classify these two activities as 'transitional', under certain conditions and with a time limit.[15]

The multiplication of taxonomies and the challenge of harmonisation

Other global financial centres are also developing location-specific financial regulations. The Association of Southeast Asian Nations (ASEAN), the world's fifth largest economy, published an initial version of its taxonomy at the end of 2021.[16] The objective of this text is to establish a common vision on sustainable finance, taking into account the specificities of the ten member countries.[17] For example, during the negotiations, it was necessary to accommodate the nature of their economies: Singapore depends heavily on services, whereas Vietnam relies mainly on agriculture or industry. The aim of the text is to serve as a comprehensive guide and working basis for the member States, providing them with a common language. The text is currently not legally binding but aims to direct capital towards sustainable investments. This is to be achieved through the information provided to investors, by providing a sufficient level of confidence in low-emissions activities. The five principles promoted by this taxonomy are to:

1. Be an overarching guide for all ASEAN Member States, providing a common basis for efforts and complementing national initiatives

2. Take under consideration other international taxonomies and, where, appropriate, contextualise to facilitate an orderly transition to a sustainable ASEAN

3. Be inclusive and beneficial to all members

4. Provide a credible framing text and definitions

5. Be aligned with the sustainability initiatives of the capital markets, banking and insurance sectors

In keeping with the various principles as well as the objectives of this founding text, Singapore decided in January 2021 to produce its own taxonomy under the aegis of Singapore's Green Finance Industry Taskforce (GFIT). The second phase of public consultation has been underway since May 2022, with completion scheduled for June 2023. This taxonomy would be compatible with the EU and ASEAN taxonomies, as well as relying on them for inspiration. The second phase of consultation emphasises the use of a traffic light system to classify activities according to their contribution to climate change mitigation. The colour green designates an activity that contributes substantially to climate change mitigation, operating in a net-zero manner or on track to achieve net-zero by 2050. The amber light represents activities that are either transitioning to the green category by a given deadline, or help to facilitate drastic emission reductions in the short term. The final category, red, is used for hazardous activities that are currently not compatible with a net-zero trajectory. Eventually, this tricolour categorisation will be applied across the eight selected sectors (agriculture, land use & forestry, real estate, transport, energy, industry, communications, waste & circular economy, and carbon capture & sequestration). Singapore's goal

is to finalise its taxonomy so that it can be applied from Q4 of 2023. Currently, there is no information on whether the authorities will make it mandatory or optional for companies to report on activities aligned with the taxonomy.[18,19]

The year 2022 also saw the introduction of the first taxonomy on the African continent. Based on a National Treasury guidance note published in 2021, the South African taxonomy addresses a call for the development and adoption of a '*taxonomy for green, social and financially sustainable initiatives, consistent with international development, to create credibility, drive investment and enable effective monitoring and reporting of performance*'. In its current version, the document takes into account only the risks and opportunities of climate change, in view to deploying a just transition to a low-carbon, socially inclusive and resilient economy. Thus, as with the European document that inspired it, the South African taxonomy is defined as a living text to be updated on a regular basis. The first version, published in June 2021, has been tested by six financial institutions. Companies are encouraged to use the taxonomy while developments are still underway. This will allow investors access to information on climate change risks and help them make decisions.[20,21]

On a global scale, the objective is to intensify the mobilisation of private capital towards sustainable environmental investments. To this end, two organisations are spearheading efforts, the International Platform on Sustainable Finance (IPSF) and the Network for Greening the Financial System (NGFS). The IPSF, created in 2019 by the European Union together with several other members, including China, is a forum for dialogue among policymakers. With 18 members to date, the organisation represents more than half of the world's greenhouse gas emissions and half the world's population. Its aim is to compare sustainable finance tools and approaches in view to making them more comparable and interoperable.[22] The latest version of the Common Ground Taxonomy (CGT) Instruction Report, released in June 2022, identifies 72 activities that contribute to climate change mitigation. The report also presents areas of overlap between the EU and Chinese taxonomy to provide clarification for international investors.[23]

Established at the One Planet Summit in 2017, the NGFS is a group of central banks and supervisors who, on a voluntary basis, agree to share best practices to accelerate the implementation of green finance at scale. With more than 100 members and observers, the organisation is present on five continents and represents around 85% of global emissions. Its aim is to strengthen global response within and outside its membership to meet the goals of the Paris Agreement.[24]

Encouraging transparency of ESG practices by stakeholders

Beyond taxonomies, regulations relating to the transparency of financial actors on their ESG practices are also being strengthened.

Pending the entry into force of the European taxonomy, the EU Regulation 2019/2088 on Sustainability Disclosure in the Financial Services Sector (SFDR) saw the light in March 2021.[25] In contrast to the taxonomy, which applies to all European entities, the SFDR exclusively concerns the financial institutions (insurers, investment firms, pension institutions, fund managers) and financial advisors in the European Union. The main objective of the regulation is to provide greater transparency as to the environmental and social characteristics of financial products. This should make it easier for investors to distinguish and compare the management of financial products, and therefor choose those that best fit their investment strategy.

The SFDR regulation is gradually coming into force as legislation governing its application is published. Among other things, it requires financial institutions to integrate sustainability risks into their investment and compensation policies. Financial entities will also have to report on the negative impacts of investment decisions on sustainability factors. The regulation provides a list of 18 key negative impact indicators representative of the negative environmental or social effects investment decisions are likely to produce. New information regarding financial products must also be published.

The methodology adopted by the SFDR is 'comply or explain': financial companies or products that choose not to publish such information will be required to explain why they believe the negative impact principle does not apply to them.

To catalogue and demonstrate different levels of compliance with these criteria, the SFDR is divided into several categories. Each category has its own article: Article 6, Article 8 and Article 9. To be categorised as a sustainable investment product (Article 9), a financial product must make sustainable investment its main objective. Funds categorised as 'Article 8'—products promoting environmental and social issues—do not have sustainable investment as their primary purpose but promote social and environmental features. Finally, a product categorised

FINANCE

FIGURE 2

SOURCES, INCENTIVES, OBJECTIVES AND SECTORS IN SUSTAINABLE FINANCE DEFINITIONS AND TAXONOMIES

Source: OECD, 2020

	CHINA TAXONOMY	EU TAXONOMY	FRANCE DEFINITIONS	NETHERLANDS DEFINITIONS	JAPAN DEFINITIONS
SOURCES					
SOVEREIGN GREEN BONDS			X	X	
GREEN LOANS DEFINITION IN LEGISLATION	X	X	X	X	
GREEN LOANS DEFINITION IN LEGISLATION	X	X	X	X	X
INCENTIVES					
INTEREST RATE INCENTIVES	X		X	X	
TAX INCENTIVES OR SUBSIDIES	X		X	X	X
MONETARY POLICY/ COLLATERAL INCENTIVES	X				
OBJECTIVES					
SOCIAL OBJECTIVES INCLUDED	X	X	X		
CLIMATE CHANGE ADAPTATION		X	X	X	X
CLIMATE CHANGE MITIGATION	X	X	X	X	X
WATER AND MARINE PROTECTION	X	X	X	X	X
POLLUTION PREVENTION AND CONTROL	X	X	X	X	X
WASTE AND RECYCLING	X	X	X	X	X
ECOSYSTEMS/BIODIVERSITY	X	X	X	X	X

as 'Article 6' is considered to have no sustainability objective. Products that do not fall under either Article 8 or Article 9 are, by default, classified as 'Article 6'.[26, 27]

Since the implementation of this regulation, changes have been observed in the investment choices of both managers and asset owners. By the end of 2021, according to Morningstar figures, around 42% of funds marketed in Europe were Article 8 or 9 funds and more than 200 new funds meeting the same standards were launched in the last quarter of 2021, accounting for more than half of all fund launches. Some institutional investors have decided to invest exclusively or mostly in new Article 8 or 9 funds. The new regulation is putting pressure on asset managers to change their portfolio management policies. Even if the full text is not yet in place, it is conceivable that it will be very difficult in the future for large financial entities to endorse financial products classified as Article 6.[28]

On the other side of the Atlantic, progress is less striking. The US is still in the early stages of introducing its own version of similar regulation. Indeed, in March 2022, the commissioners of the Securities and Exchange Commission (SEC), the US federal financial markets regulator and supervisor, announced that they would take up the issue by issuing proposed rules to improve and standardise climate-related information for investments.[29] These rules were published in the Federal Register in March 2022, and open to public comment.[30] Under the new rules, a foreign or domestic company would be required to disclose its greenhouse gas emissions (Scopes 1 and 2), and have them verified by a third party. Otherwise, this disclosure would primarily consist of qualitative and governance disclosures, as well as annual financial reports. The rules proposed by the SEC are based on existing international texts and methodologies, such as the Task Force on Climate Related Financial Disclosures (TCFD) and the Greenhouse Gas Protocol.

Response to this announcement has varied widely, depending on the political orientation of business leaders. The Republican Party wants to sue the regulator, arguing that the SEC has no authority on the matter. Moreover, Republicans accuse financial institutions, and especially the regulator, of seeking to ruin the fossil fuel sector, which accounts for more than 80% of the energy used in the country.[31] Conversely, financial regulation experts supported by Democratic representatives believe that the US financial regulator, as well as financial institutions, must shoulder their responsibilities in light of the urgency of climate change. Further progress on this text is expected in the coming months as comments and questions are considered following the release of the SEC's announcement.

KEY TAKEAWAYS

Since the introduction of the taxonomy in Europe and in several countries, it is difficult to believe that a return to the past is possible. The new regulation provides a framework for and fosters sustainable investment. Most of all, it limits greenwashing activities. The obligation to publish environmental information in a regulated and identical manner makes it possible to standardise and clarify the data collected. With a European SFDR regulation focused on the environmental impact of financial products, Europe is a global leader. The coming years will be critical for establishing the US regulation, for aligning existing regulations and for extending existing taxonomies to other environmental objectives as well as to 'brown' and 'transitional' activities.

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FINANCE

TREND
SUPERVISION

Authorities are using stress tests to assess financial actors' exposure to climate risks

To assess the climate risks financial actors are exposed to, market and other authorities are increasingly experimenting with an extension of a widespread financial practice: stress tests. The first systemic tests yield initial observations as to the exposure of institutions in different parts of the world.

DATA OVERVIEW

Financial institutions are increasingly exposed to climate risks

Financial authorities in charge of supervision around the world are taking an increasing interest in climate-related financial risks (CFR) and in preparing the financial sector to address them. As proposed by Mark Carney, former Governor of the Bank of England, such risks are generally assigned to three categories:

- 'Transition risks', arising from the implementation of a low-carbon economic model on economic actors
- 'Physical risks', resulting from the uncertain economic effects of climate change on our environment
- 'Liability risks', caused by rising litigation against financial players to hold them responsible for climate inaction[1]

The insurance industry is particularly exposed to the 'physical risks' posed by climate change. According to an assessment by Swiss Re, natural catastrophes generated $112 billion worth of insured losses in 2021, the fourth highest annual total on record (**Figure 1**).[2] According to an assessment by the European Insurance and Occupational Pensions Authority (EIOPA), one of the three European System of Financial Supervision (ESFS) supervisory agencies, '*All property-related lines of businesses are expected to be impacted by physical climate change risk.*'[3] In 2020, about 80% of business losses from storms and floods in Europe were due to building damage.

The category of 'transition risks' is currently materialised most visibly through divestment movements, in which financial institutions exit from activities deemed incompatible with the climate objectives of the Paris Agreement, such as exploration/extraction of oil or gas fields and opening coal-fired power plants. The Global Fossil Fuel Divestment Commitments Database currently lists 1,550 institutions committed to some type of fossil fuel divestment (**Figure 2**), for a total value of $40.48 trillion.[4] In October 2021, La Banque Postale was the first financial institution to announce its complete withdrawal from the oil and gas sector by 2030.[5] Back in 2019, the Norwegian Government Pension Fund, which, in addition to being the world's largest sovereign wealth fund ($1.2 trillion in assets), is closely linked to the oil industry, announced what was then the largest ever divestment from fossil fuels, amounting to some $13 billion.[6] For its part, the International Energy Agency recommends, in its roadmap for a carbon-neutral energy sector in 2050, that investments in any new fossil fuel extraction project be halted as of today.[7]

'Liability risks' take two main forms for financial institutions and the non-financial companies they finance. First is the increasing number of climate-related lawsuits against private entities, particularly in the

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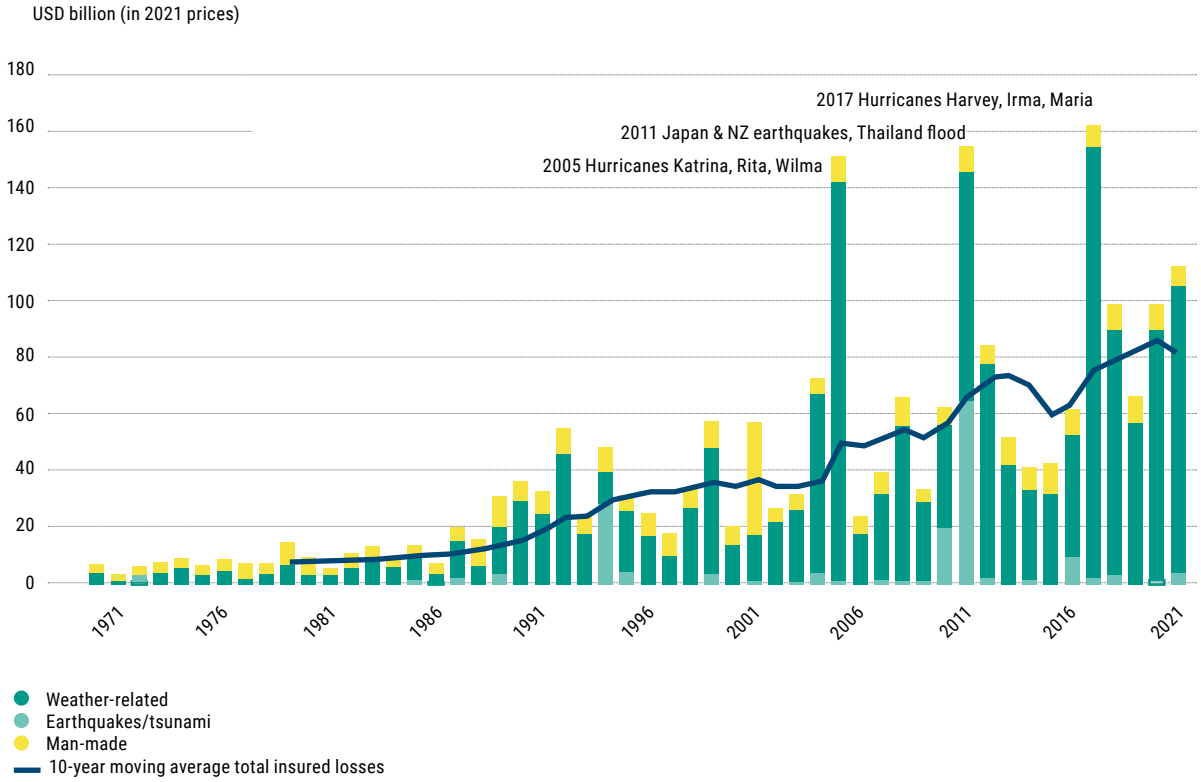
FIGURE 1

CAUSES OF INSURED LOSSES SINCE 1970

Source: Swiss Re Institute, 2021



US, Europe and Australia. Of the 193 climate lawsuits filed in 2021, 38 involved private sector defendants, compared to 22 in 2020.[8] A number of these lawsuits have resulted in landmark convictions, such as the ruling against Shell by a Dutch court on 26 May 2021. Shell was asked to increase its climate ambitions, following a complaint filed by seven NGOs and supported by 17,000 signatories. However, another form of 'liability risk' is materialising for private entities: shareholder activism. At ExxonMobil's annual general meeting, activist hedge fund Engine No. 1, with the support of major financial players, succeeded in placing three directors on the oil company's board on the same day as Shell's conviction.[9] Meanwhile, Chevron's shareholders voted 61% in favour of a resolution requiring the company to reduce its emissions.[10] In 2022, 172 environmental resolutions were proposed at general meetings (+39% year-on-year year), including 71 regarding the measurement of GHG emissions, and 14 on ending financing for fossil fuels.[11] These movements affect financial institutions directly when they find themselves the target of such actions, and indirectly when they are invested in the companies involved.

At present, financial authorities appear to be primarily concerned with how these risks affect the financial sector and much less with what role the financial sector plays in increasing them in turn. Consideration for physical and transition risks, known as the 'double materiality principle', is complicated by the highly political nature of transition risks.

This increasingly certain and significant materiality (the simple kind), uncertainty about the shape of events, the irreversibility of climate events (as opposed to most economic events), are all reasons that clamour for better disclosure practices on institutional exposure.[12,13] The report of the Financial Stability Board (FSB) Task Force on Climate-related Financial Disclosures (TCFD) in 2017 was a first practical step in efforts to assess climate risks by financial authorities.[14]

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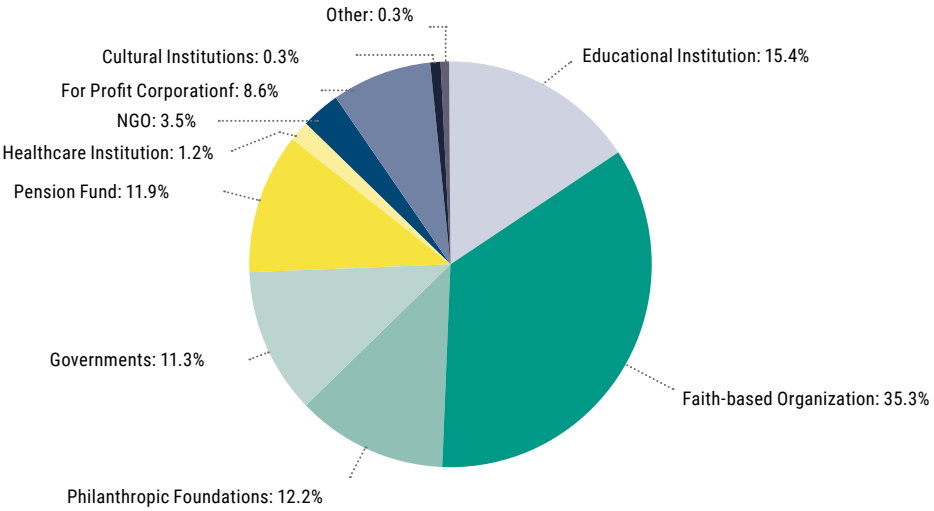
FIGURE 2

TYPOLOGY OF INSTITUTIONS DIVESTING FROM FOSSIL FUELS

Source: Global Fossil Fuel Divestment Commitments Database, 2022



THE OBSERVATORY'S LENS

Climate stress tests on the rise as supervisors test out a new tool

To increase awareness of climate risks, authorities apply the principles of stress testing, taking into account the specificities of climate risks — and most notably their longer time horizons. These exercises are designed to study the impact of external shocks on the solvency of a financial institution ('microprudential' stress tests), and on the financial system as a whole ('macroprudential'). By simulating a future climate scenario, for example, stress tests assess the capacity of a financial institution, considered in isolation or as part of a group, to withstand a shock, a major incident or an anomaly that might transpire in the course of its activities. Pilot climate stress tests have already been carried out in the Netherlands (2018),[15] in France (2020),[16] and at the level of the European Banking Union,[17] as well as in the United Kingdom (2021),[18] Canada[19] and Singapore.[20]

This first round of climate stress tests, whose results are not associated with binding capital requirements for financial institutions, has already made it possible to identify challenges that must be overcome for the exercise to become a fully-fledged supervisory tool in coming years. As such, they are a fundamental proving ground for institutions and supervisors alike.[21] In addition to the need for access to granular and sufficiently recent data— which legislators are gradually addressing through reporting requirements — the modelling constitutes a challenge in and of itself, given the aim of (1) interpreting climate variables, (2) converting this into impact on macroeconomic variables and, (3) disaggregating this impact across sectors to (4) quantify the combined impact on financial firms.[22]

In the remainder of the present analysis, we will first review the climate stress tests carried out to date by central banks and financial authorities in France, the Netherlands and the United Kingdom. These exercises are among the first ambitious climate stress tests and have therefore attracted attention in economic literature. Secondly, we will look more closely at the methodology adopted for the first comprehensive stress test of the banking system by the European Central Bank (ECB) in 2022, whose results were published in July 2022. Although the banks participating in this exercise used estimates rather than actual data from their counterparties,[23] the European climate stress test remains more interesting to discuss at the banking union level than at a national level. We will also consider the preparatory work of the European Insurance and Occupational Pensions Authority (EIOPA) for an insurance stress test at European level.[24] The third and final section will open up a few avenues for further study on how to meet the challenge of modelling in the years to come.

The first climate stress tests: The Netherlands, France, the United Kingdom

The three stress tests carried out in the Netherlands, France and the UK are viewed as exploratory and preliminary. Like the latest ECB exercise (**see below**), their purpose was to gain knowledge and help build the

capacity of financial firms to identify their exposure to climate risk, gather information and assess the strategic outlook of banks. While the methodologies used by the three supervisory authorities differ, the scenarios used in the exercise are fairly comparable and based on the four scenarios contained in the Network for Greening the Financial System (NGFS)[25] recommendations:

- The 'business as usual' aka 'worst case' scenario focuses on physical risks and assesses the extent to which their impact can damage the economy and the financial system.

- The 'orderly transition' aka 'best case' scenario outlines the preferred transition for mitigating physical risks without generating excessive transition risks.

- Two intermediate scenarios exploring various alternatives to assess the trade-offs between best- and worst-case scenarios.

The approaches are also often described in terms of their 'top down' and 'bottom up' components. A top-down approach signifies that the exercise is overseen a single authority, which provides the scenario, the key assumptions, and directs the analyses. A bottom-up approach is one in which companies produce the results through their own modelling and may include their own assumptions (especially as these better reflect their individual situations), while basing themselves on a shared scenario. Naturally, these concepts make sense only in the context of micro-prudential stress tests, as banks cannot work up systemic simulations on their own.

1. The stress test process

The climate stress test conducted by the Banque de France (BdF) and Autorité de Contrôle Prudentiel et de Résolution (ACPR) is acknowledged to have been the first truly comprehensive and demanding climate change risk assessment exercise.[26] It was completed between July 2020 and April 2021, with the voluntary participation of nine banking groups representing 85% of the combined French banking balance sheet and fifteen insurance groups representing 75% of French insurers' cumulative balance sheets.[27] In the UK, the Bank of England (BoE) and the Prudential Regulation Authority (PRA) conducted their climate stress test from January through June 2021, with the voluntary participation of the country's seven largest banking groups and five largest (re)insurers.[28, 29]

In both cases, responsibility for conducting the stress test was shared across the various parties. In France, the ACPR oversaw the exercise using an analytical framework provided by the BdF, but banks and insurers were involved by participating in the various working groups. In the UK, the BoE designed the exercise, with contributions from its Financial Stability Department and the PRA via the relevant BoE committees. Banks, insurers and a large reinsurance company also participated, using their internal models to estimate the impact scenarios would have. In both cases, a methodological guide was published to help participating institutions frame the exercise and to clarify expectations.[30, 31] Authorities in both countries also conducted a further 'reconciliation' exercise to ensure consistency between the sum of all individual submissions and the systemic impact of climate stress on banks and insurance companies.

Both the French and English exercises employed three of the four scenarios from the NGFS recommendations, extended to a 30-year horizon. These were: orderly transition, disorderly transition and late transition (equivalent to 'business as usual' with an average temperature increase > 4°C by 2100). For the latter scenario, the BdF discounted measures taken in the 2020 through 2050 period as having a limited impact on physical risks, which are determined by the concentration of greenhouse gases (GHGs) accumulated in the atmosphere over the prior 20-25 years. The BoE/PRA made a different choice by assuming that, absent a rapid transition, certain financially significant physical risks would start to emerge well before 2050. It therefore anticipates risks that are generally expected post 2050 in conventional scenarios.

A stress test was also conducted by De Nederlandsche Bank (DNB), the Netherlands' central bank, in 2018, with the voluntary participation of 3 banking groups, 50 pension funds and 29 insurance companies.[32] DNB conducted this truly pioneering exercise without involving private sector participants, taking a purely top-down approach, although it did use data it received concerning exposure to various sectors.[33] DNB did not include physical climate risks in its exercise. It employs two scenarios with short-term horizons (two years), adjusted for two dimensions that reflect key aspects of transition risk—policy and technology—that come close to the intermediate scenarios proposed by the NGFS:

A 'political shock' scenario that is essentially the same as the NGFS's disorderly transition scenario, and assumes late political action

A 'confidence shock' scenario, in which firms and households postpone investment and consumption due to uncertainties about public policy and

technology. This scenario presents parallels with the NGFS 'business as usual' scenario

However, the stress test's two additional scenarios differ fundamentally from those proposed by the NGFS. They are:

- The 'technology shock' scenario, which assumes that the share of renewable energy doubles in five years

- The 'double whammy' scenario, in which a technological breakthrough is combined with a delayed policy response

2. Designing Models: from climate scenario to financial impact

All three exercises base their calculations on the National Institute Global Econometric Model (NiGEM), a large-scale structural macro-econometric model of the world economy that NIESR[a] has been developing since 1987.[34] This framework includes separate models for each OECD country as well as for several large emerging countries (like India, Brazil and South Africa). Other countries are covered by regional blocks. Based on NiGEM, the economic impacts of climate scenarios are translated into macroeconomic impacts (GDP, interest, inflation, and unemployment rates, etc.).

To link GHG emissions, carbon prices and economic trajectories for each sector in each scenario, the BoF/ACPR and BoE/PRA pilot tests used Integrated Assessment Models (IAMs). The IAMs integrate economic and climate modelling and the most advanced of them even take into account estimates regarding changing energy systems, as well as shifts in agriculture, technology, infrastructure and health. In the French exercise, sector interdependencies were accounted for in the economic conversion of climate scenarios, notably by considering substitution effects resulting from rising carbon prices (emergence of a new technology, for instance). In addition to adjusting for carbon prices, the BoE/PRA incorporated economic impact from legislative requirements governing the energy efficiency of buildings and vehicles.

For its part, the DNB developed sector-specific 'transition vulnerability factors' (TVFs), with an average TVF assigned to the economy (weighted per the value-added of each sector) set at 1. Based on the DNB's energy transition scenarios, sectors were assigned to the macroeconomic models based on only their direct GHG emissions and thus based on the impact of carbon pricing (through a carbon tax). After adjustments to reflect the risk factors identified for each scenario, sector TVFs are multiplied by the stock prices yielded by the macroeconomic model, permitting an estimate of losses by sector.

Once these economic models established, the economic impacts were converted to financial impact. The French and British exercises also attempted to complement the sectoral approach with a more granular approach:

In France, financial impacts were extrapolated from economic assumptions based on four models: (1) the BdF's internal rating model for calculating default probability (DP) and models of stock price elasticity as a function of carbon pricing, (2) a scenario-based dividend stream discounting model, (3) a discounting model for damages paid out by insurers, and (4) a model estimating credit spreads.

In the UK, the financial impact of economic developments was assessed by the financial institutions themselves. Certain assumptions and variables were imposed by the BoE, which institutions were asked to apply with in conjuncture with their respective exposures to governments, businesses and households.

For the DNB exercise in the Netherlands, financial impact was estimated for each institution on the basis of losses due to exposures and changing spreads according to the type of financial product and sector.

The BoE/PRA and BoF/ACPR stress tests furthermore included elements of what is known in the literature as the 'dynamic balance sheet' i.e., the possibility that institutions may conduct a sectoral reallocation of their portfolios during the test period.

3. Conclusion

Due to the high levels of uncertainty associated with their results, it seems unlikely that the outcomes of these stress tests will be used to set capital requirements. No information has been published regarding the individual exposure of any particular institution—a condition of their volunteering to participate in the three exercises. The aggregate results, however, have been disclosed and provide observers with an initial assessment of the risks, exposures and vulnerabilities of the financial system. Internally, the results of the stress test may have

a The National Institute of Economic and Social Research (NIESR) is the oldest independent economic research institute in Britain.

helped banks to rebalance their exposures and adjust their risk management. Notwithstanding the methodological uncertainties and approximations already mentioned, several observations can be drawn from these exercises. Geographically, half of the exposure to climate risk is in France and a quarter in other European countries. France and Europe are particularly sensitive to transition risk but are overall less exposed to physical risk. In France, however, specific climatic events (droughts and floods in metropolitan France and cyclones in the French Caribbean) could cause insurance claims to increase by a factor of five or six by 2050. In terms of transition risk, credit costs could triple for the seven most sensitive NACE sectors/groups identified. Nonetheless, this estimate excludes an economic recession induced by the climate crisis prior to 2050.

ECB: a first climate stress test in 2022

The European Central Bank's climate stress test was conducted on 104 'significant' financial institutions in 2022, taking over from the stress tests previously conducted on a macro-prudential basis only ('Economy-wide climate stress tests').[35] It consists of three modules, within which financial institutions provided information on their own **climate stress simulation capabilities**, their **dependence on carbon-emitting sectors**, and finally, on their **performance under different scenarios and over several time horizons.**[36] This third module was limited to 41 banks amongst those directly overseen by the ECB.

1. General overview of conclusions

The framework built under the European System of Financial Supervision (ESFS) in the aftermath of the 2008 financial crisis is based on a collaboration between national supervisors and European institutions, specifically the ECB and the European Banking Authority (EBA). While the ECB is at the centre of the exercise, the conclusions drawn are in fact those of a cooperative of national and European actors.

Internal stress testing capacity: More than 60% of banks have no stress testing framework for climate risk, and only 20% consider climate risk in their loan process. Nevertheless, institutions seem to have made progress in establishing climate stress testing frameworks. Most also indicate that they will invest in staffing to improve their climate risk stress testing capabilities.

Scenario performance: The scenario analysis confirms that physical risk has a heterogeneous impact on European banks, as it depends on sectoral activities and location.

Exposure to carbon-emitting sectors: Nearly two-thirds of banks' revenues from non-financial companies are derived from greenhouse gas-intensive industries. This exposure comes from a small number of large counterparties. However, the different institutions exhibit significant variations, especially in terms of financial dependence: custodians and asset managers, as well as global systemically important banks (G-SIBs), are found to be less dependent on revenues from emissions-intensive sectors, compared to development banks/promotional lenders, investment banks and domestic retail banks. Furthermore, the sector breakdown of emissions reveals that the relative share of revenue from GHG-emitting sectors is high overall, but the largest shares of revenue are attributable to sectors with relatively low intensity, such as construction, wholesale and retail trade, and real estate activities.

This sectoral breakdown can be complemented by carbon-intensity estimates broken down by scope:

The report also highlights the importance for institutions of collecting actual Scope 3 emissions data or developing robust estimation techniques, given the extensive use of indirect estimates.

According to the ECB's analysis, the most emissions-intensive sectors (mining and quarrying as well as coke manufacturing in particular) tend to be dominated by large companies. This could explain why systemically important banks, universal banks and investment banks are more exposed to GHG emitting sectors.

The conclusions of this first ECB climate stress test should be taken with a grain of salt, however, given the considerable simplifications that are inevitable at this stage of climate stress tests' development: the exercise is currently aimed primarily at methodological learning.

2. Methodology

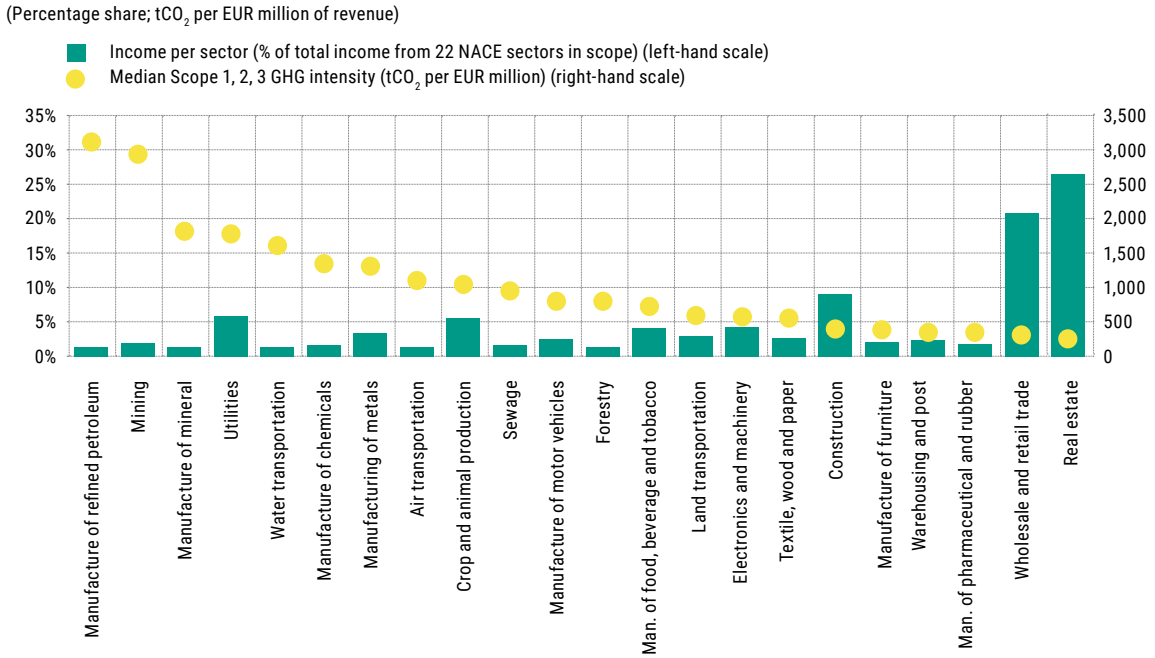
The documents published in October 2021 by the ECB for the benefit of banks detail the stress test methodology.

Internal stress testing capabilities are addressed via a questionnaire consisting of 78 closed questions (drop-down type) aimed at obtaining an overview of banks' climate risk stress testing capabilities. The questions cover governance, integration of climate risk stress test results into strategic decisions, methodology and scenario design, data availability and use, the Internal Capital Adequacy Assessment

FIGURE 3

INTEREST, FEE AND COMMISSION INCOME PER SECTOR FROM 22 CARBON-INTENSIVE INDUSTRIES, AND MEDIAN OF SCOPES 1, 2 AND 3 GHG INTENSITY[b]

Source: ECB, 2022



Process (ICAAP),[c] future plans and internal audit procedures. This module is essential in light of the freedom the ECB offers banks in terms of the methodology to be followed, according to its own bottom-up logic.[37] The topics of the questionnaire are based on the four themes structuring the climate stress test since 2020: business model and strategy, governance and appetite for risk, risk management and disclosure. In addition to the qualitative results yielded by this section, the approach allows the ECB to compare banks, thanks to a rating system assessing their individual level of preparation compared to peers.[38]

Exposure to carbon-intensive sectors is assessed through a set of metrics calculated by the banks to evaluate their exposure and the sensitivity of their business strategies. This module is more binding and standardises the banks' disclosures, allowing for subsequent comparison of results. It comprises two sets of metrics. The first focuses on the sectoral and geographic distribution of revenues (interest and fees, together with the amounts associated with such revenues), limited to 22 non-financial sectors (based on the NACE classification). It is permitted at this stage to exclude revenues from certain countries, provided that 80% of total revenues are disclosed, or at least five countries (including the home country) are considered if the first criterion cannot be met. The second set of metrics involves the carbon 'intensity' variables for each counterparty. In simplified terms, it gives the ratio of emissions to the average annual revenues of business partners, and weights this against the bank's exposure. Again, only non-financial companies are considered, and SMEs are excluded. The institution must select the fifteen largest counterparties for each sector in terms of exposure.

The **performance of banks under various scenarios** is assessed on the basis of projections made by the banks using different risk parameters. The scenarios employed are based on those proposed by the Network for Greening the Financial System (NGFS) in late 2021.[39] There are two scenarios for assessing transition climate risk:

A short-term scenario (three-year horizon) assesses a bank's response to an unexpected and sudden

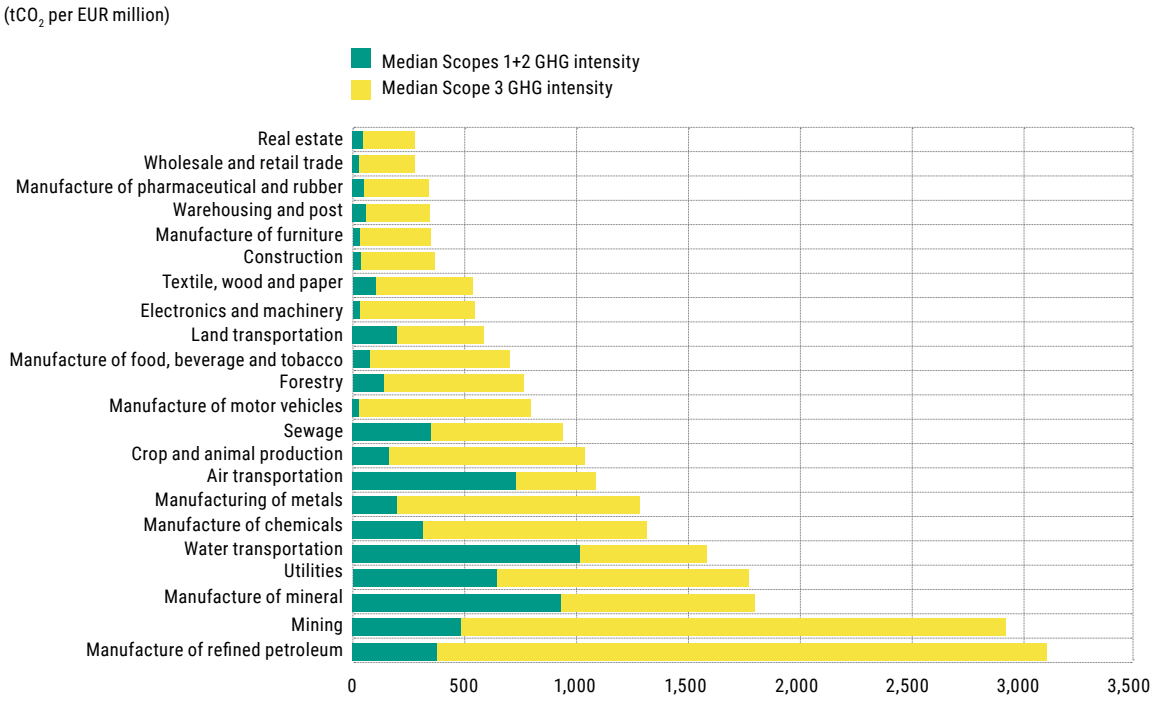
b Currently the vast majority are approximations due to lack of data.

c The Internal Capital Adequacy Assessment Process (ICAAP) is an exercise for self-assessment of financial risks by banks to ensure that they possess sufficient capital.

FIGURE 4

MEDIAN SCOPES 1+2 AND 3 EMISSIONS INTENSITY PER SECTOR[b]

Source: ECB, 2022



carbon price shock, both in terms of credit risk (risk of default by borrowers) and market risk (risk of losses resulting from market price movements).

A long-term scenario (30 years) is divided into three assumptions, corresponding to the scenarios recommended by the NGFS: (1) an orderly transition; (2) a delayed and disorderly transition; and (3) a 'hot world' (no action scenario). The stress test team made assumptions about the evolution of each bank's balance sheet and questions their vulnerability based on the adaptability of the business strategy. The dynamic evolution of the balance sheet in the long-term scenario analysis is a differentiating element compared to the approach recommended in European Banking Authority (EBA) studies. As market risk is much more difficult to estimate in the long term, the second scenario is limited to the analysis of credit risk.

Physical climate risk is also assessed through two scenarios, each with a one-year time horizon: one for drought and heat, the other for flood risk.[40] The scope of the physical scenarios covers exposures not secured by real estate (drought risk) and corporate and mortgage loans secured by real estate (flood risk). In the case of flood risk, the ECB provided the key data for the projection: geographical maps of flood risk levels and house price shocks for each of the regions on the map.

In its *Climate Risk stress test methodology*, published in October 2021,[41] the ECB provides some methodological expectations on credit risk estimation in the chapter 'Expected credit loss projections'. However, these expectations remain generic; no guidance is given on how the bank should relate the variables provided to credit risk parameters, and institutions may make their own assumptions, e.g., as regards customers' ability to withstand transition costs, reputational risk, etc. This flexibility allows institutions to extrapolate by aggregating similar risk exposures across multiple counterparties.

Beyond scenario analysis and in order to gain insight into current and future plans for financing the green transition, the participating institutions provided qualitative and quantitative information on their strategies: (1) their quantitative criteria for selecting counterparties to support the transition, (2) the assets under management related to the provision of green financing instruments and (3) the key performance or risk indicators developed to monitor progress towards alignment with the transition requirements.

3. Towards the design of climate stress tests for insurers

In April 2021, EIOPA issued an opinion[42] based on a consultation regarding the use of climate change financial risk scenarios in the Own Risk and Solvency Assessment (ORSA),[d] to promote convergence and consistency in the consideration of these issues. The document provides general information on assessing materiality and climate change scenarios, based on fictitious practical cases. The document provides insight into EIOPA's position on climate stress tests in the insurance sector:

Regarding the **analysis of materiality**, EIOPA presents a qualitative analysis of two fictitious insurance companies (life and non-life) on the basis of their portfolios (assets/liabilities), by establishing the business context as well as the climate risks faced by the company and identifying precisely over what time horizons and in which ways the business will be impacted. Next, a quantitative analysis identifies/situates all the company's exposures, seeking out and quantifying the possible impacts of climate change on these exposures. EIOPA provides tools and methodologies to quantify the impact of climate change.

In terms of **scenario analysis**, EIOPA presents three methods for analysing physical risks: (1) using the NGFS Climate Impact Explorer,[43] which shows the evolving severity of climate change in different countries and regions and for different scenarios; (2) using the results of the *Peseta IV* study,[44] which offers an understanding of the effects of climate change on Europe, and the sectors that affect climate change; (3) using available climate change scenarios, such as those provided by the NGFS

No proposals have been made to date for scenario analysis around transition risk.

In January 2022, EIOPA published a third version of its *Methodological principles of insurance stress testing,*[45] which it describes as a methodological toolkit for creating and calibrating EIOPA's future climate stress tests as part of its role in overseeing the insurance sector. In April 2022, EIOPA also launched a climate stress test for the European occupational pensions sector,[46] in coordination with the European Systemic Risk Board (ESRB) and the ECB. This involves completing a questionnaire on exposure to carbon price inflation, a questionnaire on the ESG performance of institutions, and a scenario analysis. Results are due to be published in December 2022.

Given the learning objectives of the pilot tests and their limitations in terms of data and methodology, none of the prudential climate tests conducted to date will be used to set minimum capital requirements ('Pillar I').[e] With its 2022 climate stress test, the ECB stands out as the authority that has taken the exercise furthest. The institution will take under consideration the qualitative results of its stress test, together with its ongoing review of how banks integrate climate and environmental risks into their strategies, governance and risk management, in conducting its 2022 Supervisory Review and Evaluation Process (SREP).[47] These reflections could feed into Pillar II requirements emerging from bilateral dialogue with banks, an outcome most likely to impact those institutions with persistent deficiencies. However, there are still several major areas where considerable work remains before climate stress tests become a full-fledged supervisory tool:

1) Engaging in strategic thinking about climate risk: The results of climate stress tests can be used from a strategic perspective, as they provide a long-term view of the institution's vulnerabilities to climate risk and can help to strengthen financial stability in the short term.[48]

2) Accessing and managing data: Climate stress tests are constrained by uneven data availability/coverage, poor quality, low granularity, limited comparability and standardisation as well as poor integration with financial processes.[49] These bottlenecks persist in the absence of legislative disclosure requirements, but institutions need to develop their capacity to manage and meet such demands in the future, by engaging in dialogue with their stakeholders (companies, data providers) and enhancing their internal capabilities.

3) Providing human and financial resources to carry out these exercises within institutions: The acquisition of key climate-specific knowledge and skills within institutions is essential to effective exercise design and execution. Such skills are also highly strategic

d ORSA is an internal process of risk and solvency assessment by the organisation.

e Under Basel III, so-called 'Pillar 2' requirements are capital requirements defined for each bank, which apply in addition to the minimum capital requirements ('Pillar 1'), to cover risks that the minimum requirements have underestimated or fail to cover.

for financial institutions in the long term. Developing them goes hand in hand with establishing policies to anchor this new function within institutions, and to make data integration central to the business so that a dedicated stress test team does not operate in isolation.

4) Developing scenario analysis capacity: The ECB's 'bottom-up' approach, which requires institutions to analyse the impact of a scenario based on an internal model of their own and in coordination with authorities, appears to be the preferred solution for stress tests going forward.[50] Institutions will therefore need to develop methodologies for selecting variables, modelling and quantifying risks. Filling the gaps in current in-house models, systematising coordination with external modellers and academics to expand scenarios and improve understanding of the various models is a research and development challenge that must be taken up.[51] For example, there is still a great deal of uncertainty concerning 'second round' effects when it comes to assessing the impact of market participants' actions on equilibrium prices and behaviour. Research in this area is still highly theoretical and far from ready for practical applications.[52]

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FINANCE

TREND
TRANSPARENCY

As it surges ahead, the ESG market seeks to standardise transparency norms

Financial institutions increasingly focus on their environmental, social and governance (ESG) impact, and markets are commensurately eager for transparency regarding the extra-financial performance of assets and companies. However, a diversity of data providers, the absence of international reporting standards and broadly shared metrics have all contributed to the rise of a market lacking in consistency and direction. In order to effectively guide participants and standardise disclosure practices, new regulations are emerging, and international initiatives are attempting to bring order to the landscape.

DATA OVERVIEW

Extra-financial transparency remains elusive as ESG investments explode

Environmental, social and governance (ESG) investing is growing at a high speed. In 2021, a record $649 billion was invested in specialist ESG funds, up 19.7% from 2020 ($542 bn) and 127.7% from 2019 ($285 bn). ESG funds now account for 10% of global assets under management, according to data from Refinitiv.[1] Per Bloomberg, the total value of ESG assets under management could exceed $41 trillion in 2022, and $50 trillion by 2025.[2]

These figures illustrate investors' growing interest in financial products that address extra-financial objectives. While foremost driver of this trend is a desire to manage the risks associated with financial institutions' portfolios, monitoring the impact of investments on the environment and society is another. To achieve this, financial institutions must rely on the ESG performance data companies disclose.

However, surveys conducted among financial actors show that not all topics receive the same attention. According to the CDP's annual questionnaire, for instance, a greater proportion of the 377 financial institutions consulted assess their portfolio's exposure to climate-related risks and opportunities (86%) than to water (67%) or forests (55%).[3] The law firm White & Case, which analysed the reports and proxy statements of 50 Fortune 100 companies listed with the Security and Exchange Commission (SEC), notes that all the companies examined now make ESG disclosures relating to the environment. Climate-related disclosures in particular are quickly becoming more common.[4]

Furthermore, within any particular sector, company performance in terms of ESG engagement and transparency may vary widely. For example, according to the Forest 500, which analyses the commitments of world-leading commodity companies exposed to deforestation risk, 58% of the 500 companies and financial institutions involved in forest-risk supply chains have made commitments on the issue of deforestation, compared to 57% in 2020, and 52% in 2019. The level of commitment varies, from an average of just 28% in the leather sector and 30% in the livestock sector, to 72% in the palm oil business. But most of the companies making commitments struggle to provide evidence on progress towards their targets. Furthermore, 93 of the 150 financial institutions deemed most exposed to deforestation have no commitment to combating deforestation in place, while providing $2.6 trillion in financing to companies carrying the highest deforestation risk.[5]

Such disparities, which are not unique to environmental objectives, reveal a wide range of standards and methods for assessing ESG performance. Market dynamics highlight the importance of rigorously defining ESG criteria to ensure that assets are aligned with climate and sustainability objectives.

THE OBSERVATORY'S LENS

A scattered standardisation of ESG practices is underway

The TCFD and UNEP FI, two international frameworks for promoting the collection and communication of ESG information and company performance

Beyond the adoption of regulations by authorities to better identify and qualify investments with a positive impact on the environment and society (**see 'Supervision' trend**), initiatives are emerging with a view to improving transparency and communication by stakeholders through the disclosure of companies' extra-financial performance.

France, for example, has long been at the vanguard, introducing its New Economic Regulations (*Nouvelles Régulations Econonmiques)* legislation, known as the 'NRE law' (2001),[6] followed by the Grenelle I law (2009)[7] and Grenelle II (2010),[8] which have not only made it possible to establish environmental objectives and sectoral roadmaps, but to embrace an ecological governance, aimed '*primarily [at] expanding the right to environmental information by prompting public entities and companies to disclose the ways in which they take into account the imperatives of sustainable development in their strategies*'.

This makes access to extra-financial information a critical component of managing and monitoring the shift towards a less carbon-intensive economic model, both on the part of companies themselves and of the financial sector, which must finance the economy's transition. Reliable databases are a prerequisite to the useful exercise of such a right to information. Consequently, the French and European authorities have acknowledged the growing urgency of imposing clear rules to ensure solid extra-financial reporting based on robust indicators that are easy to access for investors and the other stakeholders.

Furthermore, transparent and consistent extra-financial reporting makes sustainable investment decisions easier for private and public investors. And last but not least, it permits closer scrutiny of corporate activities and governance, with the option of rewarding the most virtuous companies aligned with various climate and societal objectives. Indeed, the frequency with which scandals have emerged in recent years has prompted regulators to exercise greater oversight and companies to protect themselves from reputational risk.

These reinforcements on verification and oversight highlight a peculiarity of the ESG field, namely that the definitions of eligible activities or investments are currently imprecise, which increases the risk of variably demanding interpretations by economic and financial actors, increasing risks of investor confusion and greenwashing. This is why creating a reference framework for the disclosure of extra-financial performance to ensure the best possible access to transparent, accurate and standardised data has become a major priority.

To meet regulatory requirements and societal expectations effectively, companies need frameworks for communicating their extra-financial performance. These frameworks must offer levels of standardisation sufficient to permit maximum utility and comparability of ESG information. In view to meeting this need, various private and public bodies have started to propose criteria and reporting models adapted to different sectors.

Consequently, with the rise of ESG investing, fund managers need ESG data, tools and analytics to facilitate decision-making and steer their portfolios towards commitments that are quantifiable and measurable. ESG data plays a central role in meeting the information needs of stakeholders and investors on topics including risk management, contributions to the Sustainable Development Goals (SDGs) and environmental and social objectives.

Since 2017, the Task Force on Climate-related Financial Disclosures (TCFD), an initiative of the G20's Financial Stability Board (FSB), has been proposing a series of recommendations on how to communicate transparently on financial risks related to climate issues. The guidelines are also designed to help investors, lenders and insurers take decisions on capital allocation. The TCFD is structured around four themes critical to business operations: governance, strategy, risk management, and performance indicators & targets. To date, the TCFD's recommendations are not binding and rely on companies' willingness to participate. However, the UK has set a target of making compliance with TCFD recommendations mandatory by 2025 for companies in most sectors,

which opens the way for future regulatory positioning of the TCFD.[9] Other countries, such as Australia, Canada, Italy, South Africa and Turkey are in the process of consulting with the private sector to make the reporting framework compulsory.

Adopting a similar focus on consistency and comparability in ESG reporting, the United Nations Environment Programme Finance Initiative (UNEP FI) has developed a reference framework to ensure the strategic alignment of banks with the Sustainable Development Goals (SDGs) and the Paris Agreement. The *Principles for Responsible Banking* (PRB) enable signatory banks to ensure that their business makes a positive contribution to society. The principles are divided into six main categories:

- Aligning business strategy to be consistent with people's needs and to contribute to societal goals
- Defining targets and positive impacts
- Including customers and consumers to promote sustainable practices
- Consulting and engaging with relevant stakeholders to achieve societal objectives
- Establishing effective governance and a responsible banking culture
- Attentively monitoring individual and collective implementation of the principles to ensure transparency and accountability for both positive and negative impacts

To this effect, PRB signatory banks are required to periodically show how they are meeting social expectations through structured reporting and standardised disclosure of extra-financial performance indicators and targets. Today, more than 270 banks, representing over 45% of the world's banking assets, have joined the UN initiative. A similar framework has been proposed by UNEP FI for the insurance sector with the *Principles for Sustainable Insurance* (PSI).

Rating agencies are driving a growing ESG data market

Access to extra-financial information can considerably affect investment choices according to a '*best in class*' approach,[10] which involves the construction of a portfolio favouring issuers that exhibit the best ESG practices in their sector of activity. This approach is gradually gaining traction in the financial sector thanks to ESG labels (e.g., the SRI Label, Greenfin, etc.). Another factor is the influence of rating agencies, which rely on the extra-financial reporting of companies in designing their evaluation criteria.[11,12]

While the various ESG compliance and disclosure initiatives are a direct response to the needs of investors and public bodies, extra-financial data is now also essential for companies, to limit the risks associated with their activities. It is crucial to have reliable performance indicators to prevent and anticipate financial losses (e.g., stranded assets) over varying time horizons. Today, climate risks are classified into two main categories: physical risks (direct results on a company's business due to the effects of climate change) and transition risks (financial impact related to the restructuring involved in shifting to an economic model that emits less GHG). As this is a key issue for both financial players and companies themselves, integrating extra-financial data into risk measurement has become a critical focus.

Optimal assessment of extra-financial risks calls for standardised and transparent frameworks. According to the Woodwell Climate Research Center,[13] the lack of transparency in risk measurement makes it impossible to guarantee the scientific validity of information provided to investors and regulators. Indeed, the wide variance in methodological choices regarding risk measurement can easily lead to forecasting errors. One solution for dealing with disparities is to establish standards that specify the choice of risk model, the selection of appropriate time horizons and the choice of scenarios for the various environmental factors.

Ratings agencies appeared at the beginning of the twentieth century, following the 1907 banking crisis in the United States, which exposed the need for independent and relevant indicators to rate and evaluate the profitability and financial soundness of companies. Moody's was the first player on the market to provide ratings on demand, followed by Poor's, the Standard Statistics Company and Fitch Publishing.

Well into the 1970s, many players entered the rating market without any specific control or regulatory obligation. The first oil crisis in 1975 and subsequent crises (Enron scandal, 2008 financial crisis, etc.) confirmed a need to regulate these independent agencies. It was at this time that ESG ratings based on extra-financial data began to appear at specialised agencies, before developing exponentially in the early 2000s.

This nascent and—at the time—poorly regulated activity yielded a multiplicity of players specialising in the collection and provision of ESG data and indicators. This exacerbated the heterogeneity and dubious transparency of the underlying methodologies as well as the design of indicators. Today, the ratings agency market is becoming increasingly concentrated due to various takeovers of European agencies specialising in extra-financial information by the 'Big Three', Moody's, Standard & Poor's and Fitch, which account for over 90% of the financial ratings market. In 2019 alone, Moody's acquired Vigeo Eiris and Four Twenty Seven, while Standard & Poor's acquired TruCost in 2016, RobecoSAM in 2019 and recently merged with IHS Markit in 2020. Other data providers, such as MSCI, ISS ESG, Sustainalytics or even the London Stock Exchange Group have come to represent a considerable part of the ESG data market. This consolidation of the market should lead to more reliable ESG data on the one hand, and to easier access to said data on the other. In addition, other, more specialised players, such as CDP, Ecovadis and Ethos remain alive and well, providing more specific and targeted services in the realm of ESG ratings. CDP, for example, offers to make climate data reported by companies and cities public and accessible on its platform. Ecovadis, on the other hand, offers a range of comprehensive solutions for managing the ESG risks and performance of supply chains. Many companies are now offering innovative services designed to rate, assess and manage extra-financial data, each with its own approach to handling ESG information.

Weaknesses of ESG data in terms of transparency, reliability and standardisation

Disparities in methodological and thematic choices

The problems encountered by investors in attempting to collect, process and disclose ESG data are multiple. Notable current challenges in ESG reporting include companies' unreliable self-assessments of ESG performance due to increased greenwashing, a lack of transparency in methodologies used to calculate indicators, and the absence of standards that would enable data comparison.

In March 2022, asset manager State Street Global Advisors (SSGA)[14] published an article on the challenges facing ESG data and the importance of data quality in responsible investing. The text presents several examples of ESG rating cases and data from reputable ratings providers. These providers are essential when it comes to collecting, evaluating and rating companies on their ESG characteristics.

SSGA observes that when a stakeholder selects a single provider from the field, not only will they have a biased viewpoint due to alignment with that provider's ESG investment philosophy, but they will make decisions based on this viewpoint without a thorough understanding of how the data or information was obtained, since the methodology used by a data provider is often proprietary.

The article identifies several areas of divergence. First, procurement techniques and data estimation models can vary considerably. Second, providers may have differing biases regarding materiality in relation to the same company. Third and last, ESG data providers have their own methods for aggregating and weighting certain ESG factors, and these are not disclosed to stakeholders or investors. Similarly, a 2022 OECD publication[15] on ESG ratings compares four providers, illustrating how the scores provided by these players vary considerably in their calculations given that they are based on different types of data and do not share weighting or extrapolation methodologies.

These heterogeneities in ESG orientations are not only found among providers. Comparing databases for US and European companies, Intercontinental Exchange,[16] a provider of ESG data, found considerable differences in company reporting practices between these two geographical areas. Indeed, these reports vary globally in terms of the indicators disclosed, the areas covered, and the societal objectives targeted. For example, European companies tend to report more on their commitment to the SDGs, and are more comprehensive and rigorous when reporting on climate, circular economy and social inclusion issues. The European market is commensurately more mature than its US counterpart in terms of ESG reporting and setting extra-financial targets.

In addition to differences in maturity that may currently exist between the United States and the European Union, there are also considerable differences in the approaches adopted by regulators in each geography as regards ESG issues. On the one hand, the European Union has favoured centralising its extra-financial objectives via the regulations mentioned above, enabling a common framework of actions and measures set at different time horizons. Conversely, the United States has opted for a less regulatory vision privileging voluntary ESG

FINANCE

FIGURE 1

MAPPING OF MAJOR RATINGS AGENCIES AND ESG DATA PROVIDERS

Source: AMF, 2020

LARGE FINANCIAL ACTORS	ACQUISITIONS OF HISTORICAL ESG PLAYERS	MAIN SOLUTIONS/SERVICES (O/W RATINGS & INDEXES)	+ OTHER KEY INDEPENDENT ACTORS	
MSCI	Innovest (2009) RiskMetrics (2010) GMI (2014) Carbon Delta (2019)	ESG Ratings (AAA to CCC) MSCI ESG Indexes & Bloomberg MSCI ESG Indexes	CDP	Climate, Water, Forest data, ratings and rankings
MOODY'S	Vigeo Eiris (2019) Four Twenty W (2019)	ESG Scores & Assessments ESG Indexes with Euronext (eg. ESG CACA40, Eurozone 80…) and Solactive	FactSet Ecovadis	ESG ratings & services for investors Sustainability Assessment
S&P GLOBAL	TruCost (2016) RobecoSAM (2019) HIS Markit (merger, 2020)	EST Evaluation & ESG Score (Corporate Sustainability Assessment) DoW Jones Sustainability Indexes (DJSI) S&P ESG Indexes	Arabesque Inrate	ESG Data & Scores : S-Ray & ESG Book ESG Impact Ratings
ISS ESG (DEUTSCHE BÖRSE, 2020)	Ethix SRI Advisors (2015) SouthPole (2017) Oekom (2018)	ESG Corporate Rating, Governance Quality Score, ESG Scorecard, E1S Disclosure Qualityscore… ISS ESG EVA Leaders Index Series	Rep Risk	ESG Risk Platform
SUSTAINALYTICS (MORNINGSTAR, 2020)	Jantzi (2009) ESG Analytics (2015) Solaron (2018) GES (2019)	ESG Risk Rating (grade from 0 to 50+, the lowest is the best)	Ethos Owl Analytics	ESG Rankings & ratings by cause ESG Data, Scores & rankings
LSEG (LONDON STOCK EXCHANGE GROUP)	FTSE Russel Refinitiv – Thomson Reuters (2019) Beyond Rating (2019)	Refinitiv « Company Data » (including ESG) FTSE4Good Invest, FTSE ESG, Climate… Russel ESG Indexes	Covalence Impak	ESG Ratings & Data Impact Assessment, Rating and Tracking for Investors
BLOOMBERG		Bloomberg's Environment, Social & Governance (ESG Data)	EthiFinance	ESG Assessment and European SMEs
SUSTAINABLE FITCH		ESG Ratings, ESG Relevance Scores, Climate Vulnerability	CSR Hub Ideal Ratings	Consensus ESG Ratings ESG Ratings & Scores

disclosure mechanisms. An article by the Brookings Institution, a think tank, entitled "The risks of EU-US divergence on corporate sustainability disclosure," argues that such divergences offer asset managers an opportunity to pick and choose the definition of ESG criteria themselves.[17]

Financial actors in need of public support and available corporate data

It is clear that without support from public authorities, it is complicated for data providers and financial and extra-financial actors to make choices that will meet societal expectations.

An article published by the consultancy I Care and Consult[18] addresses the extra-financial transparency requirements facing European financial institutions under the European Commission's Sustainable Finance Action Plan (notably *Sustainability-Related Financial Disclosure EU 2019/2088* - SFDR) and Article 29 of the French Energy-Climate Law, (**see 'Regulations' trend**).[19] The authors highlight the importance of identifying and developing robust indicators to meet new transparency requirements, but also note the difficulties for financial entities of navigating the selection of ESG indicators from various 'sub-domains'.

Climate-specific indicators are increasingly prevalent in extra-financial reports. However, stakeholders are left with a vast array of indicators, whose values vary according to methodological choices (e.g., types of allocations and alignment). Furthermore, results may arise from the range of emissions studied by the entities and whether or not they choose to include Scope 3. This makes it difficult to compare indicators between companies and sectors.

In addition, financial companies must now develop indicators to measure biodiversity footprints. Here again, stakeholders must navigate a host of standards and methodologies as far apart as the Corporate Biodiversity Footprint and the Global Biodiversity Score[20] which adopt different approaches over time. Meanwhile, other recommendations are taking shape, such as the Biodiversity Footprint Financial Institutions (BFFI) tool[21] and the Taskforce on Nature-related Financial Disclosure (TNFD).

However, identifying and selecting indicators constitutes only one aspect of the challenge for investors. The major difficulty lies in the availability of company data, and access to the information required to perform ESG analysis, which varies greatly depending on the investment type and the influence of the financial institution. The industry, origin and size of the company also have a significant impact on data availability. For instance, a small or medium-sized, company, with small support and guidance from regulation, will face difficulties to collect hardly accessible data on a voluntary basis.

The accessibility of ESG data in Europe is set to increase with advent of a Corporate Sustainability Reporting Directive (CSRD).[22] For context, on 21 April 2021, the European Commission (EC) adopted a proposal for a Directive on Corporate Sustainability Reporting (CSRD) to address current difficulties in the collection and use of extra-financial data. Amongst other changes, the proposal extends to all companies with more than 250 employees the obligation to collect extra-financial information, requires audits of the information provided and introduces more detailed reporting requirements. However, the main contribution of this European Commission proposal consists in endorsing European Sustainability Reporting Standards (ESRS),[23] which serve to standardise the reporting methods of European companies.

These actions should make ESG data easier for investors to access. Also to this end, the European Commission has announced the creation of a European-wide database providing a single portal for regulated information to centralise all disclosures by European listed companies: the European Single Access Point (ESAP). This is relevant, as a lack of internal financial and technical resources to collect and process the data available to financial actors can lead to a dispersion of the data and information available to investors.

The battle between EFRAG and ISSB over ESG reporting standards

The Global Reporting Initiative (GRI), close to the European vision, has long provided industry standards to ensure best practices in the realm of extra-financial performance disclosure. The GRI has articulated 10 principles for ESG data to ensure high quality sustainability reporting. Four principles relate to content: stakeholder inclusion, sustainability context, materiality, completeness. The remaining six pertain to quality: accuracy, balance, clarity, comparability, reliability, timeliness.

To address the difficulties encountered in obtaining data from companies, various entities are developing extra-financial reporting standards. The IFRS Foundation has set up an International Sustainability Standard Board (ISSB) which aims to propose sustainability standards that will be understandable,

applicable and accepted worldwide. It differs from the European project in that it focuses solely on the financial materiality of ESG risks, whereas Europe will also impose reporting on companies' ESG impact, per the principle known as 'double materiality'.

It goes without saying that such parallel standardisation work risks promoting the development of two divergent approaches, defeating their purpose and further confusing companies' ESG reporting practices.

The absence of a 'universal standard' for ESG data presents several obstacles to achieving credible results in both the short and long term. Worldfavor,[24] a consultancy, has compiled a series of implications to justify the need to align ESG and other extra-financial reporting requirements under a consistent framework. Among other effects, they point out that the proliferation of standards, frameworks and initiatives is forcing companies to each come up with the resources needed to design their own models for disclosures. A single standard for extra-financial information would help companies know what's expected of them in terms of reporting content and how to communicate this information to stakeholders. According to Worldfavor, having a single ESG management system would ensure key stakeholders secured full control over what is measured and how.

Bearing witness to the difficulties companies face in ESG reporting, Schneider Electric published an article in April this year, entitled 'Trends & challenges with standardising Corporate ESG disclosures'. In it, competing standards for ESG disclosure are presented as misleading and time-consuming for ESG reporting. Companies lack clarity on the norms to adhere when reporting, which severely limits stakeholders' ability to assess and compare ESG performance and risks.

The main source of complexity in creating a universal ESG reporting mechanism comes from questions around the feasibility of extra-financial reporting and whether it should be compulsory or voluntary. In September 2020, five major global reporting organisations joined forces to form the Comprehensive Reporting Group, with the intention of providing a common framework with a single set of global reporting standards. This could also allow ESG data providers to have a single frame of reference for the information collection and processing phases. The group brings together frameworks that reference the GHG Protocol, Global Reporting Initiative (GRI), CDP, Climate Disclosure Standards Board (CDSB), International Integrated Reporting Council (IIRC) and Sustainability Accounting Standards Board (SASB).

KEY TAKEAWAYS

Janine Guillot, Executive Director of the Sustainability Accounting Standards Board (SASB),[25] sees the transparency of ESG practices as a 'collective effort to be taken up by all market players,' including asset owners, asset managers, data providers, standards and policy makers. Granted, bringing these parties together is a challenge in own right, however, this merely underscores how coordinated work by all stakeholders, public and private, is critical to addressing the many issues we currently face. Measuring the footprint of financial players' actions in a structured manner should make it possible to identify the best levers for action to reduce this footprint. This effort involves standardising calculation methodologies, strengthening databases and reinforcing the reliability of reporting systems.

Following the European Commission's public consultation on ESG ratings, the Autorité des marches financiers (AMF) has called for the establishment of a European regulatory framework for ESG data, ratings and services providers.[26]

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CASE STUDIES

FINANCE

PROJECT CASE STUDY

COUNTRY	COMPANY	GREEN BONDS ISSUED	CONSTRUCTION TARGET
KENYA	ACORN HOLDING	$35.7 MILLION (2019)	50,000 LOW-CARBON STUDENT LODGINGS

The first green bonds financing low-carbon student housing

According to the World Bank, Kenya needs to build 250,000 homes annually for four years to erase its housing deficit of 2 million homes, even as some 60% of Nairobi's population lives in slums. In 2019, Acorn Holding, a Kenyan property development company, issued East Africa's first-ever green bonds. Initial evidence is now available to assess the mechanisms and impact of this financial instrument for developing affordable, low-carbon student housing.

A development project supported at the national level

In 2017, President Uhuru Kenyatta launched the Big 4 Agenda, a development programme with four objectives: 1) food security; 2) affordable housing; 3) manufacturing; and 4) affordable healthcare. Under this programme, the government pledged to deliver 500,000 homes by 2022, to be sold at prices ranging from $6,000 to $30,000. According to available analyses, this target is far from being met.

In parallel, however, the Kenyan government also launched the Green Bonds Programme Kenya (GBPK), in partnership with Financial Sector Deepening Africa (supported by the UK, Kenya's largest bilateral donor), the Kenya Bankers Association (KBA), the Nairobi Securities Exchange, the Climate Bonds Initiative and the Dutch development bank FMO. The programme aims to support innovative financial instruments to develop the green bond market in Kenya, notably through tax exemptions.

Two years later, Acorn Holding, a developer, operator and manager of housing assets in sub-Saharan Africa, issued the first green bonds in East Africa. The bonds, listed on the London Stock Exchange and the Nairobi Securities Exchange, raised 4.3 billion Kenyan shillings ($35.7 million) to build 50,000 low-carbon student homes. The bonds are certified by the UK Climate Bonds Initiative for the project's potential contribution to reducing emissions from residential buildings. The designs are certified to the Excellence in Design for Greater Efficiencies (EDGE) green building standard, promoted by the International Development Finance Club (IDFC). In fact, this is the first Kenyan green bond to be certified by an international agency.

A robust financial ecosystem to buttress the bonds

Green bonds address Acorn's need to secure the capital outlays that must be advanced for building construction. The ratio the between high short-term capital costs of construction and the long-term savings generated by the energy performance of an efficient building can slow down investment decisions. This is why Acorn has developed a financial ecosystem complementary to its green bonds which, together with the guarantees provided by international lenders, helps to secure the project. Firstly, a D-REIT (*Real Estate Investment Trust* specialising in development and construction) was created to undertake, develop and stabilise the operations of the certified buildings using its own funds. The green bonds issued, which have a maturity of five years and a fixed interest rate of 12.25%, provided additional capital through debt. Lastly, an I-REIT (I for income) is set to acquire the properties and become the long-term owner and operator. GuarantCo, a guarantee fund for infrastructure projects in Africa and Asia, owned by FMO and PIDG, and funded by the UK, Swiss, Swedish, Australian and Dutch governments, guarantees 50% of the principal and interest of the green bonds.

Since the start of the project, eight low-carbon housing projects have been launched—providing accommodation for 7,000 students. All of the homes are equipped with solar panels and solar water heaters, as well as sustainable water management equipment.

In Kenya, the use of green bonds is beginning to take off. Laikipia County issued the country's first municipal bonds in May 2022 to finance infrastructure projects (water, roads, etc.). Nairobi County authorities are planning to launch a new $1.2 billion green bond issue on the Nairobi Securities Exchange to finance infrastructure projects aimed at accelerating the green transition and adapting to climate change.

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FINANCE

COMPANY CASE STUDY

FINANCIAL INSTITUTION	2020 REVENUES	TARGET
ING	€17.64 BN	NET ZERO EN 2050

Achieving net zero emissions for portfolio and operations

Net-zero emissions is the condition in which anthropogenic carbon dioxide (CO_2) emissions are balanced by anthropogenic CO_2 removals over a specified period. Although the financial world is increasingly embracing stakeholder alliances for carbon neutrality, the number of stakeholders setting an emissions reduction strategy to achieve science-based targets remains limited. ING Group, a Dutch bank founded in the late 19th century, is currently a leader on the European banking market, having set targets and made efforts to decarbonise both its portfolio and its own operations.

Achieving net zero in the business strategy

ING Group became one of the pioneers in the financial world by signing a letter in 2015 announcing its intention to commit to net zero. This was to begin taking the form of concrete targets with the emergence of a viable method developed by SBTi. Thus, in the first half of 2019, ING Group joined the SBTi Expert Advisory Group focused on financial institutions. The advisory group's objective is to assist in developing a methodology for verifying net zero targets set by members of the financial sector. Prior to this, in 2018, ING became the first international bank to commit to net zero, relying on climate scenarios to guide its business strategy.

This new business strategy was established in tandem with ING's decision to align its loan portfolio (total amount over €500 bn) with the objectives of the Paris Agreement. To implement this strategy, ING Group created what it calls the "Terra approach". Terra is an approach anchored in science-based scenarios that are combined with asset-level data to align the loan portfolio with the objectives of the Paris Agreement, through customer engagement or the bank's investment choices. It draws on several different methodologies such as PACTA (Paris Agreement Capital Transition Assessment) and the SBTi SDA (SBTi Sectoral Decarbonization Approach).

One of the fundamental principles of the Terra approach involves sectoral steering of the portfolio. ING's portfolio activities are divided into sectors (power generation, fossil fuels, automotive, aviation, etc.) insofar as each has its own transition scenario. Each sector therefore has its own methodology, scope, portfolio targets and metrics. For each sector, a four-stage presentation is then followed. These stages both explain the commitment involved in decisions and contextualise the latter by explaining the challenges the sector will face. Thus, each sector has its own decarbonisation targets that contribute to achieving the portfolio-wide objective.

Banking on a change in technology

In order to keep shareholders informed of the progress of this methodology, ING publishes an annual report that includes a *Climate Alignment Dashboard*. Two main avenues have been identified to drive progress and limit emissions: supporting the engagement of existing customers to drive a shift towards low-emissions technologies and shifting investment choices to low-emissions technologies.

The 2021 report explains that in 5 of its 9 portfolio sectors (power generation, residential real estate, automotive, marine, upstream oil and gas), ING has successfully reduced the carbon intensity[a] of investments below the relevant market or climate scenario standards. The carbon intensity of the cement, steel and commercial real estate sectors, on the other hand, increased between 0.5% and 3%. Aviation, whose carbon intensity increased by 74.9%, remains a drag.

Decarbonising its own operations

Beyond efforts to decarbonise its portfolio of assets, ING is also striving to achieve net zero in its own operations. This includes an environmental programme to reduce Scope 1 and 2 emissions, as well as Scope 3 emissions from business travel. The company has furthermore developed its renewable energy sources and self-generation of renewable power, reaching 100% renewables in 2020. ING also participates in the voluntary carbon market to offset its business travel emissions by financing REDD+ projects.

a Carbon intensity is a ratio that measures the volume of emissions (e.g. measured in $kgCO_2$) relative to a volume of activity expressed in a sector-specific metric. For example, ING measures the carbon intensity of its power generation investment portfolio in $kgCO_2e$/MWh, rather than $kgCO_2e$/$ invested.

FINANCE

PROJECT CASE STUDY

PROJECT	TARGET SIZE	RESULTS IN 2020
ALTHELIA CLIMATE FUND	$101 MILLION	47 $MTCO_2$ AVOIDED

An innovative financial approach to protecting biodiversity

The earliest thematic funds for the protection and restoration of biodiversity and natural capital were swift to recognise the links between biodiversity and climate. As these funds arrive at their terms, assessments can now be made. Such is the case for Althelia Climate Fund, launched by Mirova in 2013, with a liquidation date of June 2022, extended to May 2023. Althelia's innovative financial approach aims to slow deforestation and protect biodiversity by using a combination of indicators to demonstrate the environmental, social and economic impacts of its ten projects.

Carbon offsetting, a boost for the development of nature-based solutions

Althelia invests in certain REDD+ carbon offset projects, based on the financial value assigned to the carbon locked in forests. The Tambopata-Bahuaja project, for instance, aims to ensure conservation of tropical forest located in the Peruvian Amazon, a critical zone of internationally recognised, biologically rich and deeply threatened biodiversity.

The project brings together multiple stakeholders (NGOs, government, socially responsible business) to ensure the conservation of 570,000 hectares (>1.4m acres) of natural forest, and the restoration of 4,000 hectares (9,885 acres) of degraded land as agroforestry systems for cocoa cultivation. The project is overseen by the *Asociación para la Investigación Y el Desarrollo* Integral (AIDER), a local NGO working for conservation and sustainable development in Peru.

The 12-million-euro investment in AIDER supported the project's initial development and expansion by conditioning the restoration of degraded land into agroforestry systems. The loan is repaid through diversified sources of income, such as the commercialisation of agroforestry products and certified environmental services such as carbon credits. These credits, generated by the Tambopata REDD+ Project, thus constitute a guarantee for Althelia in case of default. The implementation of the project is also ensured by providing technical assistance to producers rather than direct funding.

While carbon offsetting is at the heart of the project, REDD+ mechanisms are regularly come under fire because of the complex calculation of reference scenarios estimating the deforestation that would occur without intervention, leading to inflated performance. To avoid these pitfalls, other indicators can be used in parallel: Althelia monitors the surface area of restored land and/or the increase in members of local cooperatives benefiting from fair income.

Thematic investments supported by technical assistance facilities

The projects Althelia has invested in make it possible to experiment with various financing mechanisms. In the Brazilian Amazon, €11.5 million was invested to support the *Novo Campo* programme, led by the local NGO Instituto Centro de Vida (ICV), promoting sustainable cattle breeding, pasture restoration and supply chain traceability while ensuring the protection and restoration of forests. In the Amazon, cattle ranching is still largely associated with deforestation, and Brazil is the world's largest exporter of beef. Grazing areas have expanded over the past 30 years, accelerating deforestation in the Amazon, leaving over 45 million hectares (111.2 million acres) deforested.

To address these local issues, the Novo Campo project was organised around a management structure created specifically for this purpose. This entity is the *Pecuária Sustentável da Amazônia* (PECSA) company, created by the ICV and responsible for technical assistance and management of the development of Novo Campo. PECSA is responsible for farm management, including investments in pasture reform and rotation, infrastructure, reforestation in areas that do not comply with the Brazilian forestry code, and training of farm workers.

Like other thematic funds focused on biodiversity, the PECSA assistance facility, which was awarded the B-Corp label in 2017, makes it possible to provide high-quality technical support that is lacking in many regions, and to better respond to local issues.

After 10 years, the fund's results are positive: most of the targets have been reached and surpassed, but the income for local populations still needs to be improved. The deployment of technical assistance is a major lever in this regard. The next challenge remains the scaling up and replicability of the financial approaches involved, which must ultimately be adapted to local specificities.

FINANCE

SIGNALS

A ROUND-UP OF THE INITIATIVES, REGULATION CHANGES, AND MARKET TRANSFORMATIONS OF TODAY THAT SIGNAL THE CLIMATE ACTION TRENDS OF TOMORROW

Fintech • The emergence of a green fintech market ready to transform finance

Most financial centres are witnessing the emergence of a 'green' fintech market that includes environmental goals. This market is expected to represent an increasing share of the overall fintech market, estimated at $500 billion by 2025. In Switzerland, for example, the Green Fintech Network (GFN) was launched in 2020 to identify drivers of market development. Together with the Green Digital Finance Alliance (GDFA), a UNEP initiative, the GFN has published a classification of green fintechs to consolidate and foster this emerging market. Green fintechs are defined as '*technology-enabled innovations applied to any kind of financial processes and products, all while intentionally supporting Sustainable Development Goals or reducing sustainability risks*' and proposes seven categories of green solutions: digital payment and account solutions, digital investment solutions, Digital ESG-data and analytics solutions, digital crowdfunding and syndication platforms, digital risk analysis and insurtech solutions, digital deposit and lending solutions, digital asset solutions, and regtech solutions. In the various financial centres, green fintech is supporting the structuring of the market through various initiatives to support the transition to a net-zero economy. In 2021, the UK Financial Conduct Authority (FCA) renewed the 'Green FinTech Challenge' which encourages the development of new products and services, offering selected start-ups the opportunity to benefit from a protected implementation scheme known as the 'Regulatory Sandbox'. In Singapore, the Monetary Authority of Singapore (MAS) is spearheading three noteworthy initiatives: the creation of a Green and Sustainable Fintech Committee, the release of SGD 50 million (€35.81 mn) for an innovation programme dedicated to green financial solutions, and finally, introducing 'Green Finance' as a theme in 2021 and 2022 in its call for fintech projects. Last but not least, in France, Finance for Tomorrow has strengthened the Fintech for Tomorrow Challenge, an event awarding prizes and building partnerships to support the growth of the market.

Transparency • The case of DWS argues for increased ESG transparency

In August 2021, Desiree Fixler, former head of sustainable finance at German asset manager DWS, revealed to *The Wall Street Journal* that the company was misleading its investors by inflating the figures for assets under management subject to ESG criteria. On the basis of internal documents deemed credible, American (SEC) and German (BaFin) regulators opened a dual investigation to understand how the abusive classification of funds in the sustainable category came about. This incident shows the growing importance placed on ESG data. DWS' share price has dropped more than 20% since the revelations. Other consequences, especially reputational damage, bear witness to the financial risks of fraudulent ESG disclosures. The repercussions of this event are of wider concern to the entire financial community. Voices are being raised to point out that DWS is just one of many players that employ similar practices. It seems likely that asset managers will be called upon to better justify their ESG classification systems to stakeholders, including regulators.

Wall Street Journal, 01/08/2021

Online banking • Green neo-banks are buzzing

As a growing number of consumers seek to make sense of their savings, the 'green neo-bank' model is spreading across the globe. These fintechs offer the services of online banks (N26, Revolut, etc.) coupled with the commitment of responsible banks, exemplified in France by La Nef and the Crédit Coopératif. In Germany, one of the first 'green' financial institutions is Tomorrow, launched in 2018. Tomorrow relies on the banking licence of Solarisbank and dedicates a percentage of fees from payments to climate projects, mainly compensation projects involving tree planting. Between 2021 and 2022 in France, three green-techs—Helios, GreenGot and OnlyOne—launched banking and savings product offerings that exclude fossil fuels and finance the ecological and energy transition. However, none of these players possesses a banking licence; each has to rely on a bank (Solarisbank, Crédit Mutuel Arkéa and Treezor respectively) to accept deposits and manage customers' funds. In the United States, the banking platform GoodMoney allocates 50% of profits to environmental and social justice initiatives through impact investments and charitable donations.

Medium, 17/09/2021

Supervision • Green bonds, the new priority for central banks

The Governing Council of the European Central Bank (ECB) has decided to redirect the portfolio of corporate bonds held for monetary policy purposes and as part of its guarantee scheme, introducing climate requirements. In line with its roadmap and action plan for integrating climate change into monetary policy, adopted in July 2021, the ECB will shift its asset purchase programme towards bond issuers with low GHG emissions, ambitious emission reduction targets and good climate reporting practices. The ECB also wants to reduce the share of assets in high-carbon-footprint entities deposited as collateral for borrowing from the Eurosystem. Since November 2021, the Bank of England has 'adjusted' its asset purchase programme to align its monetary policy with the UK's net-zero targets as well. The Riksbank—Sweden's central bank—has also shifted to green bonds since January 2021.

European Central Bank, 04/07/2022

Insurance • Goodvest, leading the charge of new green insurers

Like neo-banks, neo-insurance companies are emerging by dematerialising traditional insurance services and making it possible for customers to finance virtuous projects with their savings, notably via life insurance. For instance, Goodvest, a French 'insurtech' launched in 2020, is committed to the transparency of its investment strategy, to prioritising extra-financial criteria over financial criteria and to applying strict exclusion mechanisms, notably for fossil fuels. As an insurance broker, Goodvest has created the 'Goodvie' life insurance product in partnership with Generali Vie. The first criterion they apply is a carbon footprint analysis (Scopes 1, 2 and 3) of companies and projects, to ensure portfolio alignment with the Paris Agreement, as well as with the SDGs. The insurtech also keeps a close watch on decisions and votes by asset management companies at company AGMs to ensure alignment with the 2°C trajectory. Goodvest's investment strategy has earned three labels: SRI, Greenfin and Finansol, promoting confidence, and the company recently raised €2 million from Super Capital VC.

Challenges, 19/01/2022

Impact finance • Financing and investment

Numerous initiatives are emerging in Europe to consolidate the impact finance movement, foundations have already been well established by organisations such as the FAIR association in France, or the Global Impact Investing Network (GIIN) more globally. In France, a Paris Financial Centre Task Force on impact coordinated by Finance for Tomorrow successfully arrived at a shared definition in 2021. Impact finance is thereby defined as an investment or financing strategy that aims to accelerate the just and sustainable transformation of the real economy, by providing evidence of its beneficial effects. This definition identifies three fundamental pillars of impact finance: intentionality, additionality and impact measurement. Momentum shows no signs of slowing as new operational tools continue to emerge. In the UK, the Impact Management Platform has brought together historic players in sustainable finance around impact management practices since 2021, and the Impact Task Force, with the support of the UK government (then chair of the G7), is making concrete contributions to promoting sustainable, impact-driven economies and societies worldwide. Today, impact finance is the subject of growing interest worldwide: the total value of investments with impact intentions worldwide rose from $4.1 billion to $9.4 billion between 2015 and 2019, with Europe and Asia recording the strongest growth. In France, impact funds' assets under management grew by +148% on a like-for-like basis between 2020 and 2021, from €24.3 bn to €60.2 bn. Taken together, the world's top 300 impact investors managed $404 billion in impact assets in 2020.

Investment • A rising tide of thematic funds

A thematic fund is a fund that selects its assets based on a societal theme (e.g., global warming mitigation, water management, mobility, ageing, etc.), which can span several industries, company types and geographies. Between 2019 and 2021, assets under management in thematic funds tripled to $806 billion worldwide, mostly in Europe (55%) and the US (21%). In 2021, three themes attracted investors: water treatment and management, security (IT, automotive, personal, etc.) and robotics and automation. For example, the Pictet Water P theme fund, managed by Pictet AM, focuses on companies active in water supply, treatment services, technologies and environmental services. According to a BNP Paribas survey, 76% of investors interested in climate funds are looking for exposure to the SDGs (41%), climate solutions (21%) and renewable energy (18%). In 2021, IDIA Capital Investissement, in collaboration with Forinvest, launched the first French investment fund for the wood industry. In June 2021, J.P. Morgan AM created a Climate Change Solution Fund, aligned with Article 9 of the European FSDR, with the goal of building a portfolio comprising 60 to 120 securities consisting of companies invested in several areas related to climate change mitigation (energy, transport, construction, etc.).

Net Zero • Shifting emissions into neutral, the new North star for climate finance

In a few short years, carbon neutrality—a state of balance between emissions and elimination of greenhouse gases—is a goal that has gained massive support from financial players. To establish shared objectives and methodologies, 'Net-Zero' alliances have taken shape in each sector. The oldest of these, the Net-Zero Asset Owner Alliance (NZAOA), was founded at the beginning of 2019 and comprises 74 institutional investors, including Prudential plc, Univest and Scor SE, that oversee a total of $10.6 trillion in assets. The Net-Zero Asset Manager Initiative (NZAMI) brings together more than 270 investment funds, such as Blackrock, Macquarie or Mirova, representing a total of $61.3 billion in assets. The Net Zero Banking Alliance (NZBA), launched in April 2021, now has more than 100 signatory banks, JPMorgan Chase, BNP Paribas and Bank of America among them, while the Net-Zero Insurance Alliance (NZIA), launched in July 2021, now has more than 20 members. These include AXA, Scor and Munich Re. And lastly, during COP26, the Glasgow Financial Alliance for Net Zero (GFANZ), created in April 2021 at the initiative of Mark Carney and the High-Level Climate Champions to oversee these alliances, published its inaugural progress report. The first signatories of the alliances also published their individual results at the conference in Glasgow.

Civil society • Meting out advice and accusations, NGOs are becoming the Janus of climate finance

NGOs have become extremely important to ensuring the transparency of business practices as well as compliance with climate standards and regulations in various economic sectors. To accelerate action whilst preventing corporate greenwashing, NGOs act simultaneously as advisors, accusers and whistleblowers when it comes to actions by members of the financial community. NGOs are forging partnerships with financial institutions to guide and advise them on taking environmental issues into account in their businesses. A prime example is offered by WWF and Axa, which jointly published a report on biodiversity. Reclaim Finance, for its part, attacks 'green marketing' practices and regularly reminds financial players of their commitments to divest from fossil fuels. To this end, Reclaim Finance has developed a tool to monitor the implementation of commitments by financial companies: the Oil Gas Policy Tracker. Shareholder activism also continues to grow: no less than 172 resolutions relating to the environment were proposed in 2022 (+39% in one year), including 71 that concerned GHG emissions tracking and 14 on ending financing for fossil fuels.

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CLIMATE CHANCE ASSOCIATION

association@climate-chance.org
www.climate-chance.org

FINANCE FOR TOMORROW

contact@financefortomorrow.com
financefortomorrow.com