

Climate risk in finance

CONCEPTS, METHODS
& ASSESSMENT TOOLS

SEPTEMBER 2019



FINANCE
FOR TOMORROW
by Paris Europlace

Foreword

The scientific community is unanimous about the magnitude of the environmental and climate crisis. Facing the urgency, the Paris Agreement sets up the international ambition for action. It establishes the need to shift financial flows to limit global warming under 2°C. The financial sector, now at the centre stage of climate negotiations, has become aware of its responsibility in anticipating risk and developing economic opportunities for the ecological transition. However, there is an urgent need to step things up, as the situation continues to deteriorate and the “cost of inaction” to increase. **To live up to the stakes, we must incorporate climate considerations into decision-making processes. This will imply rethinking the tools of the financial industry. In particular, it is necessary to develop convergent models to evaluate climate risk, to be used collectively by the whole industry.**

Whilst the European Commission unrolls its Action Plan for Sustainable Finance, Finance for Tomorrow wants to promote concrete strategies and tools to manage climate risk, at both the European and International levels. This work aims to leverage the French experience, its renowned technical expertise and the innovative initiatives of its market players. In France, the development of a pioneer ecosystem was supported by national regulation which has paved the way for climate transparency requirements. This momentum is about to be strengthened with the launch of an Observatory, which will be steered by Finance for Tomorrow and professional federations, to monitor the Paris Financial Marketplace progressive alignment with climate objectives.

This work fits into this dynamic. With the actors of the Paris financial centre gathered in a “Climate Risk & Methodologies” working group, Finance for Tomorrow has produced this report to share key data and provide better understanding of the issues to everyone concerned by climate risk management in the financial sector, whether they be investors, companies or other stakeholders. This collective work is unprecedented, at least for such a broad perimeter, and ought to help better identify and, hopefully, streamline methodologies and indicators for funding the ecological transition and decarbonizing portfolios. This work was a bet on information sharing and transparency. Challenge completed: by presenting available tools and solutions, this document provides the keys to developing a common understanding and a long-term strategic vision, not only for the Paris Financial Marketplace but also to contribute to European work. The methodologies map provides a useful overview of the market, decoding a landscape that was until now only accessible to experts.

We would like to extend our deepest thanks to everyone who has contributed to this work, starting with the two co-leads, Alain Grandjean and Sylvain Vanston, as well as all the other members of the working group for their involvement.



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Part 1

Financial actors facing climate risk

Climate risk and financial impact

The financial sector integrates sustainability by using the Environment, Social and Governance (ESG) factors to assess the impact on the real economy of financing and investing activities. In this way, financial professionals can align their activities towards the transition to a low-carbon and inclusive economy, and become a driving force to shift financial flows in line with the Paris Agreement and the United Nations Sustainable Development goals; this is what sustainable finance is about.

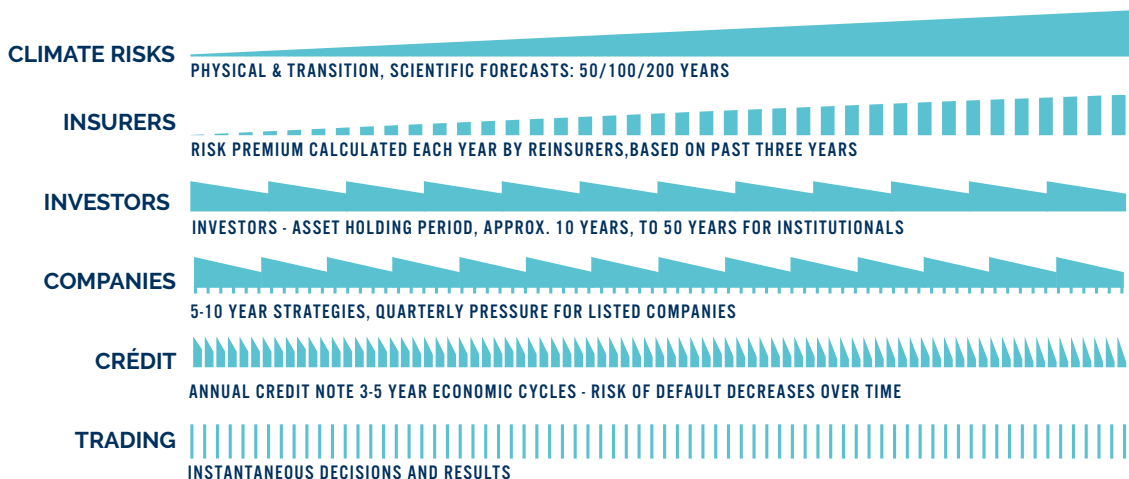
If we focus on the Environmental factor, and specifically on climate change, the year 2015 could be considered the year of birth for "Green Finance". Indeed, the Paris Agreement bolstered the international recognition of the key role of Finance for the ecological transition, by establishing from the very outset, in its article 2, the need to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

This recognition of the financial sector's role came with the understanding of the risks that climate change poses to economic players. At a global scale, climate shocks could trigger precipitous asset depreciation and affect the stability of public policy. The interaction of financial fragilities and increasing impacts of climate change forces us to consider a systemic climate risk.

The reference for climate risks typology is the speech on "Tragedy of the Horizon" of September 29, 2015 by Mark Carney, Governor of the Bank of England and then Chair of the G20 Financial Stability Board.

TRAGEDY OF THE HORIZON

Although science is clear on the long-term risks of climate change, the financial markets are struggling to incorporate these risks into processes, especially risk assessment analysis. This is due to a structural lag between the horizons used by climate scientists (very long-term forecasts) and the length of the cycles used by economic and financial players.



The reference typology establishes three types of risk through which climate change can affect financial players:

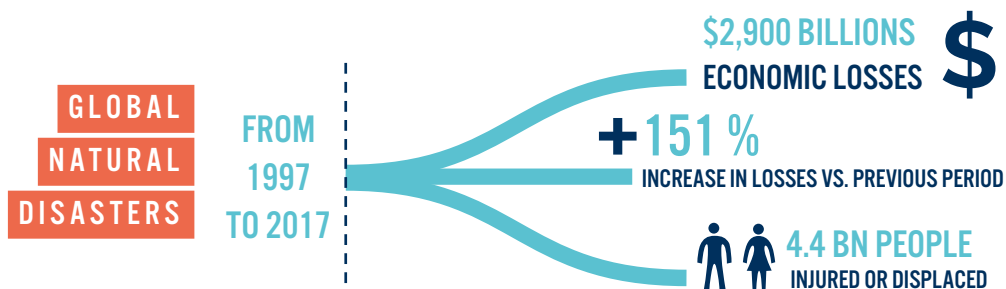


The financial sector operates largely by “taking the risk” of funding projects, based on an assessment of the likely profitability.

Insurance is the segment most directly involved in managing the concept of risk, defining its cost based on historical statistical models. These mathematical principles were developed back in the 16th century to insure major maritime expeditions. Since then, they have proven effective at protecting both people and economic players. Broadly speaking, risk level is a determining factor in finance e.g. it shapes investment choices and guides decisions about whether to grant credit. So what should happen if the historical data were no longer a reliable predictor of the future?

Climate change, which is disrupting the status quo of not just the natural world, but also the economy and society, has the potential to jeopardise our entire understanding of risk. Therefore, the financial sector has to find innovative solutions in order to cope with these changes:

- The primary threat of climate change is the increase in both the frequency and severity of “extreme” weather events with huge financial consequences;
- The economy will also be affected by “chronic” events in the long-term (e.g. increase in average temperatures and rising sea levels).

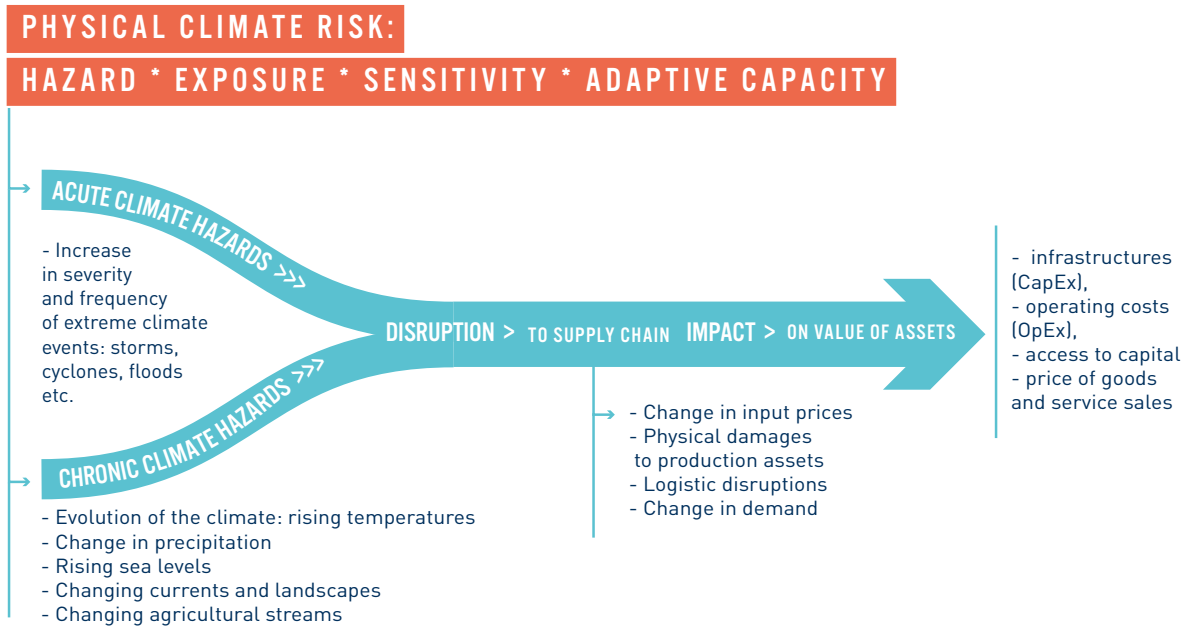


Source : UNISDR, 2018

Financial players are striving to better understand, analyse and manage climate risk. To do this, they need reliable data and assessment tools. They also need a regulatory framework designed to spur them to action.

① UNDERSTANDING PHYSICAL RISK

In Finance, analysing physical risk means measuring the unknown impact of exposure, vulnerabilities and adaptive capacity of assets faced with climate risks, based on their location and one or more climate scenarios.



Source: based on "Getting started on Physical climate risk analysis in finance", I4CE, 2019

A physical risk analysis relies on the following information

- **Potential hazards:** gradual and extreme hazards, magnitude, frequency, likelihood etc.;
- **Analysis parameters:** scope, spatial granularity, simplifying assumptions, sector-based approach, value chain factors;
- **Qualitative data** on the potential physical and financial impacts of a given hazard on a given asset (including damage suffered);
- **A physical and financial impact score**, based on more detailed data on likelihood, severity, materiality of the impact for the asset, reactive capacity etc.;
- **An assessment of the physical impacts** (expressed as m³ of water, tonnes of materials etc.) and likelihood of occurrence;
- **An assessment of the financial impacts** (expressed as cost) on the asset and portfolio;
- **Forward-looking analyses** involving several greenhouse gas emission pathways;
- **An assessment of the ability** to recover from these hazards.

The risks analysis may reach several degrees of complexity, depending on the time spent, data used and the incorporation of utility functions, harm ratios and models. The narrower the scope, the more complex the analysis because the models have to be very finely-tuned to the particular scenario. Although complex analyses can be used for broader scopes (e.g. several countries, or globally), the results are likely to come with a low confidence level and the necessary data may be non-existent or inaccessible.

② UNDERSTANDING TRANSITION RISK

In Finance, analysing transition risk means measuring the unknown impact that the shift towards a low-carbon business model will have on financial assets.

For investors, it means to adds a new strategic dimension to company analysis in relation to the ecological transition. The goal is to avoid any loss in value, as well as seizing long-term economic opportunities.

	RISKS	OPPORTUNITIES
REGULATION	Carbon pricing Transparency requirements Product and service regulations/litigation	Better information transparency
MARKETS	Consumer behaviour Cost of raw materials Uncertain market signals	Access to new markets
TECHNOLOGIES	Competition from low-carbon innovations Uncertainty over investments and R&D	Energy independence Process efficiency
REPUTATION	Consumer and investor preferences Stigmatisation of a sector	Positive reputation

Source: based on "Managing climate risks for financial actors: from theory to practice", I4CE, 2017

Stranded asset constitute a specific example of the financial impact of transition risk: to limit global warming under 2°C, over 80% of fossil fuel reserves will have to stay in the ground (Source: Unburnable Carbon, Carbon Tracker). It means assets can no longer be used, and the fossil fuel production capacity that would be "sacrificed" is valued at around \$12 trillions.

(Source: IRENA, quoted in the Financial Stability Review, Banque de France, 2019)

More information

Companies perspectives

Corporate and industrial players have to study climate risk daily, especially when considering to acquire or build new productive assets and infrastructure:

- Physical risks are to a large extent transferred via insurance policies;
- Risk matrices and scenarios are primarily developed internally;
- Being transparent over asset location is a major challenge to overcome as part of investor relations.

> See Part 4 - Investor-Corporate Dialogue

More information

On regulation

Climate risk assessment depends on access to reliable data. Transparency is therefore an increasing concern for financial players, public and private alike:

- In France, the article 173-VI of the Energy Transition for Green Growth Law requires investors to describe their approach for tackling climate issues.
- The European Commission launched an Action Plan in March 2018 designed to make sustainable finance the norm across Europe's capital markets.
- Central banks and supervisors are building knowledge for greening financial system, especially within the NGFS network.

> See Part 3 - Regulatory perspectives

CLIMATE MODELS & SCENARIOS

Recommendations for dealing with climate risk include developing forward-looking analyses, involving “possible future” scenarios. These scenarios are based on models i.e. mathematical representations of reality, that produce a range of scenarios depending on the variables used. Some models are designed to evaluate the economic impact of climate change, known as integrated assessment models (IAMs). They use two types of input, namely (i) physical data, such as the energy mix, climate and the Earth’s natural resources; and (ii) data about the global economy and structure of the financial markets.

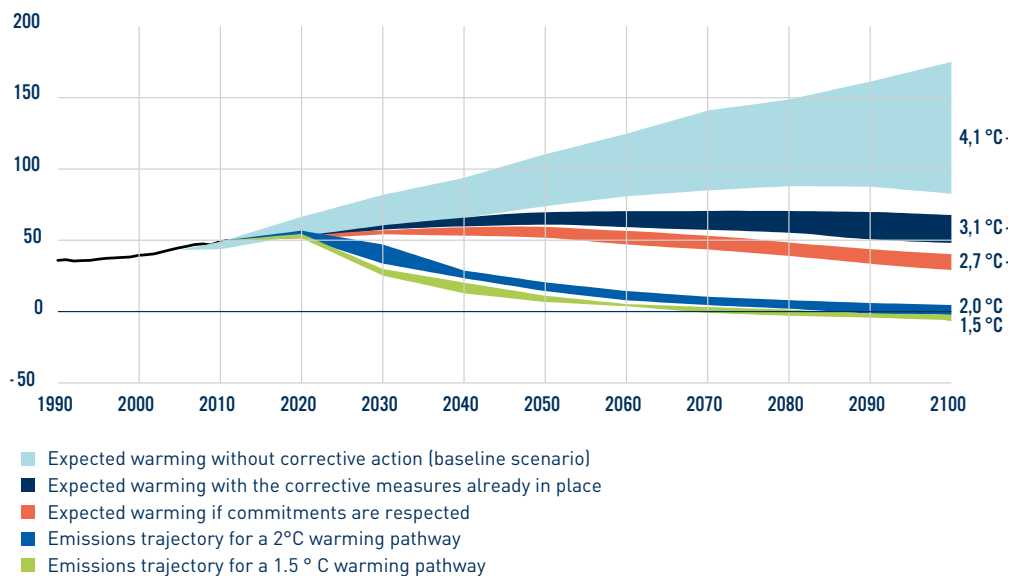
Examples: IPCC experts recognise around 30 climate models that generate over a thousand different scenarios. With this materials, they develop five narratives able to integrate the social impacts of climate change, known as the Shared Socioeconomic Pathways (SSPs); the International Energy Agency studies the energy market transition using the 2DS scenario based on the TIMES model (The Integrated MARKAL/EFOM System); institutions in France are developing and using models such as THREE (ADEME), GEMMES (AFD) and IMCLIM (CIRED).

Thanks to our understanding of climate change, the physical parameters are becoming ever-more standardised. However, given the unprecedented nature of current events, scientists are struggling to incorporate some major risks such as the possible repercussions of breaching climate thresholds and tipping points. In addition, economic models depend on highly variable assumptions. Currently, models tend to be overly optimistic, especially as regards the dependence of GDP on energy, the proactive nature of public policy and the efficiency of carbon pricing.

Climate risk is endogenous by nature, and whether it materialises will depend partly on current perceptions of the risk, which will either encourage or block preventive measures. This is why the common building of climate scenarios, at the international level, is crucial if we are to establish coherent long-term strategies.

PROJECTIONS TO 2100 OF GLOBAL GREENHOUSE GAS EMISSIONS AND WARMING UNDER DIFFERENT SCENARIOS

(annual emissions in gigatonnes of CO₂ [GtCO₂] and corresponding warming temperature)



③ UNDERSTANDING LIABILITY RISK

Liability risk corresponds to the compensation that a company may have to pay should it be found responsible for the effects of climate change.

The number of court cases is on the rise, with the tally currently standing at 1328 climate lawsuits, three-quarters of which have been brought in the USA, and six in France (Source: *Grantham Research Institute, 2019*).

The first main climate change litigations consist of lawsuits against governments:

- **Leghari v. Federation of Pakistan**, Lahore High Court, 2015: a delay in implementing regulation to combat climate risk constitutes a breach of fundamental rights.
- **Urgenda Foundation v. State of the Netherlands**, The Hague, 2015: claim for measures based on the Government's duty to "take care" and uphold fundamental rights.
- **"L'Affaire du Siècle"**, France, 2018: suing the Government to demand a change in climate policy - currently on appeal before the Paris administrative court.

There has also been a rise in lawsuits against private parties:

- *Conservation Law Foundation v. Shell Oil Products US*: a citizen suit alleging that the company failed to incorporate climate risks in its investments (in this case, a bulk storage and fuel terminal in Rhode Island).
- *Mark McVeigh v. Australian Retail Employees Superannuation Trust [REST]*: a beneficiary of the pension fund arguing that the fund's failure to provide adequate information relating to its exposure to climate-related risks prevents him from making an informed opinion about the management of the fund.

An international duty to care is emerging based on a guiding principles: "do not significantly harm" the environment

Climate risk assessment tools

Faced with climate risk, investors are seeking to protect the long-term value of their assets. They are also standing as drivers of the ecology transition by helping shift the economy towards a low-carbon model. For an investor, aligning a portfolio with a “2°C pathway” means selecting assets which are accelerating their zero-carbon strategy, in line with the requirements of the ecology transition.

EXAMPLES OF INVESTMENT STRATEGIES TO ALIGN PORTFOLIOS WITH THE 2°C PATHWAY:



In order to implement these strategies, financial players need frameworks to draw comparisons and set targets. They therefore need innovative indicators and risk management tools:

- ① **Emissions accounting using carbon footprints:** this exercise, which measures the impact of an activity on climate, enables to refer to the global “carbon budget”, a central and internationally-recognised notion that quantifies the amount of greenhouse gas that can be emitted before the 2°C global warming limit is exceeded..
- ② **Climate risk evaluation using various indicators:** the diversity of possible indicators is useful for incorporating multiple criteria into ESG strategies, expressing the financial materiality of the risks, as well as the impact of economic activities on the climate, biodiversity, and society.
- ③ **Maintaining a qualitative analysis:** it remains necessary in order for each investor to define a coherent strategy, in line with its values.

① ACCOUNT EMISSIONS: CARBON FOOTPRINT

A carbon footprint is a measurement of the greenhouse gas emissions caused by the activity of any “entity” (an individual, company, project, infrastructure, product, securities portfolio etc.), possibly over its entire life cycle.

A carbon footprint can also be used to understand how much carbon is “needed” by the entity across its entire value chain, at a given time. It may also be used to design and implement an emissions reduction plan. Since the carbon footprint is a measure of the dependence on carbon, it can also be used as a way of understanding transition risk, in the case of an increase in carbon prices, tighter regulations or technological breakthroughs.

A carbon footprint is measured using specific data about an entity’s activities, along with external “emission factors”. The result is given as an order of magnitude, because the required data are not always available. Carbon footprint calculations are defined by the international standard ISO 14064 and its application guidelines. There are two accounting methods (see page 26), the Bilan Carbone® developed by ADEME (French environment and energy management agency) and the GHG Protocol.

ANALYSIS PERIMETERS (FROM GHG_PROTOCOL):

SCOPES 1&2	Direct and indirect emissions from a company’s activities. The reporting entity is highly accountable because it can directly affect these emissions.
SCOPE 3	Emissions that occur upstream and downstream in the value chain of the reporting company, induced by the company’s activities but from sources owned or controlled by other organisations. These emissions must be included in the calculation to fully understand the entity’s carbon-dependence, even if it is only “shares” the responsibility with other players.

DEFINITIONS:

DIRECT EMISSIONS	Energy and non-energy related emissions within the organisational perimeter
INDIRECT EMISSIONS	Emissions that occur through the entity’s use of purchased electricity, heat or steam;
AVOIDED EMISSIONS	Emissions avoided due to the entity’s efforts, corresponds to the entity’s “climate benefits” (see page 15).

CHALLENGES:

Considering the Scope 3, it is challenging to determine the limits of the value chain. Reference guides have been produced to help define the elements that need to be reported from those located too far away in the value chain. By using the concept of materiality, an entity can identify the significant sources of its carbon footprint to replace the will for an exhaustive assessment with a more pragmatic approach. This concept is reflected in French law, in Standard ISO 14064-1:2018 and in emissions calculations for asset portfolios.

The carbon footprints of different entities cannot be combined: it is a strictly single-entity exercise. In theory, two entities could only combine their Scope 1 emissions without the risk of duplicate accounting. For securities portfolios and indexes (which cover a vast universe), consolidation is possible but without any guarantee of avoiding duplication or omission. The chosen consolidation method (financial control, operational control or equity share) must be the same for all reporting entities.

Induced emissions (Scope 3) and avoided emissions cannot be combined or offset because they are of a different type: preventing emissions of other actors has no incidence on the fact that emissions are still created across one’s own value chain.

Investors use the carbon footprint to identify which activities may be beneficial or harmful for the ecological transition. It helps them to pinpoint the companies with the most efficient production processes and to identify their efforts to improve practices.

② EVALUATE CLIMATE RISK: USING VARIOUS INDICATORS

Numerous indicators have been developed to help the financial sector evaluate, analyse and manage climate risk. The goal is to express financial materiality to protect asset value. The diversity of indicators allows for variation in the development of responsible investment strategies.

RISK EXPOSURE SCORES

give a technical analysis of an asset's exposure to climate hazards as well as to a broader range of ESG risks. These scores are calculated for the short, mid and long term, and apply to widely diverse assets.

Physical risk (see page 8) is analysed using a combination of local and granular information with meteorological data and climate scenarios, together with qualitative assessments. It is particularly relevant for infrastructures and production units.



Concrete risks identification; local approach, sometimes in specific geographic areas; can be used to compare securities or portfolios.



Incompatible with financial models because the score is not a probability; hard to compare scores between different methods; average scores tend to level out the data.

GREEN SHARE/ BROWN SHARE

inform financial players of a company's distribution of revenues between "green" activities that will be favoured and "brown" activities that will be penalised by the low-carbon transition.

This analysis can give either a snapshot (current activities) or forward-looking view (research and investment costs). Some analysis may be original, such as the study of filed "green" patents.

This approach is supported by the EU taxonomy for sustainable activities. (see page 23)



Defines exposure to risk and opportunity; can be used to compare portfolios; can be used to develop a strategic vision.



Hard to identify portions of a company's revenue; hard to obtain prospective data; hard to analyse the whole value chain.

FINANCIAL IMPACT INDICATORS

produce an estimated financial probability of short- and mid-term impairment due to climate risk. They are calculated using historical data models and sometimes projections.

Expected loss - Credit:

- Loss caused by default of a counterparty given the probability of a risk, in this case a climate hazard.
- Widely used indicator, used in Basel III.
- Calculation: probability of default x loss given default x exposure at default

Value-at-risk - Investment:

- Unlike a typical VaR indicator, does not express the maximum possible loss, but a delta between classic modelling and the impact of a climate hazard.
- Impact on value or ability to repay a loan.

Income and Balance sheet analysis - Strategic analysis

- Analysing changes in demand and its price-elasticity, in the context of increased technological competition of sustainable products.



Enables to incorporate climate risk into models and to monitor financial metrics.



Costly in terms of time and data; limits to the monetisation of climate risk.

INDICATORS OF ALIGNMENT WITH A 2°C PATHWAY

macro-indicators that indicate an entity's contribution to the ecological transition, by aggregating both historical and forward-looking data allowing to determine the alignment of an activity with a warming pathway

This type of indicator uses GHG emissions data to measure the carbon impact of an activity on the climate. This impact is then compared with climate scenarios and sector-based benchmarks to analyse counterparties.

Variable formats. For example: contribution to the transition compared to the rest of its sector; degree of global warming caused by an activity.

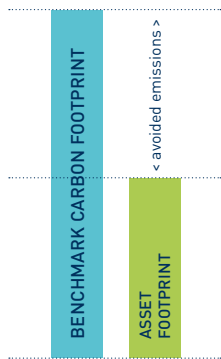


Clear message and objectives; proactive way of engaging in the transition.



Screening and strategic tools rather than material risk analysis; implies to trust climate scenarios.

MEASURING GHG EMISSIONS TO CONSTRUCT ALIGNMENT INDICATORS:



- **Carbon intensity:** relates emissions to a specific activity, making it possible to overcome the challenge of achieving an absolute reduction in emissions, for example if the company experiences strong growth. Several variables could be used, such as turnover, market cap, tonnes of manufactured goods or another unit of production.
- **Avoided emissions:** the difference between emissions from a benchmark scenario and emissions avoided thanks to an entity. It is a way of objectifying an entity's contribution to global emissions reductions by identifying its "climate benefits". They are an indication that there are opportunities to find in the fight against climate change.

There is currently no standardised benchmark and practices vary. This is why transparency is key to this approach, by sharing benchmarks with stakeholders so they can understand the figures provided.

INITIATIVES TO PROMOTE A 2°C PATHWAY FOR FINANCIAL PORTFOLIOS:

SBT-FINANCIAL INSTITUTIONS:

The Science-Based Targets initiative (see page 29) is developing sector-based approaches to identify, implement and validate scientific climate targets based on the global carbon budget. It is a collaboration between the Carbon Disclosure Project (CDP), World Resources Institute, UN Global Compact and the WWF.

A project is under way to establish a framework for financial institutions to set their own science-based targets. So far in 2019, 50 international financial institutions have contributed to this SBTi-Finance method. The methodology is being developed by Navigant & 2Dii. It uses the Sectoral Decarbonisation Approach (SDA) and production metrics specific to different technologies (PACTA). The method currently covers five asset classes: mortgages, real estate, listed equity, corporate debt and project finance.

CLIMATE ACTION IN FINANCIAL INSTITUTIONS

A coalition of public and private financial institutions around the globe aiming to adopt a pathway to systemically integrate climate change considerations across their strategies, programs and operations. The I4CE ensures the secretariat of the initiative. As of March 2019, 44 institutions had joined the Initiative and endorsed the five voluntary Principles for Mainstreaming Climate Action.

- These voluntary Principles are:
- **Commit** to climate strategies
 - **Manage** climate risks
 - **Promote** climate smart objectives
 - **Improve** climate performance
 - **Account** for your climate action

③ MAINTAIN A QUALITATIVE ANALYSIS: STRATEGIC AND NECESSARY

The accuracy of indicators is affected by major constraints, such as the availability of data, understanding shocks propagation channels, and the coherence of scenarios. Moving forward, it is important to acknowledge the “fundamental uncertainty” of the climate breakdown, since this unprecedented situation breaks the mould of existing statistical models. Therefore, it is advised to combine indicators and develop scenario analyses and stress tests. In these circumstances, it is crucial to ensure ongoing qualitative analysis in order to effectively limit the risks and to ensure the success of ambitious strategies, in line with the values of each investor and coherent with the targets of the Paris Agreement.

The different types of indicators seek to meet the range of needs of economic and financial players when dealing with climate risk. However, this very diversity is currently a sore spot for companies who need to select a service provider, release sensitive data and then trust the results of complex analyses. Nevertheless, this diversity also reflects the emergence of an activity that is becoming more structured, that is bearing expertise, and that will ultimately ensure greater transparency and stability for the financial markets. At this stage, the best way of overcoming these problems is to ensure ongoing qualitative analysis, in line with the global strategy and values of each investor.

DATA ACCESS

Building indicators implies an access to reliable, historic and prospective information i.e. granular, specific and quantified data. The quality of climate risk information is an increasing concern for regulators (see Part 3 – Regulatory Perspectives). Several initiatives have been put forward to improve the circulation of information and to help to structure the strategies of economic players (see Part 4 - Investor/Corporate Dialogue).

Building indicators is complicated by difficulties when estimating:

- what share of a company's turnover derives from a particular activity or production site;
- the sensitivity of economic models to different risks;
- the adaptive capacity of infrastructures and activities;
- the extent to which shocks spread throughout the value chain;
- strategic and research efforts by companies to align their economic activities with the transition (lack of prospective data).

Confidentiality issues: companies and financial institutions need to protect their internal data for strategic reasons. When working with external partners, legal departments should draw up non-disclosure agreements. In this situation, it is important to consider the problems of restricting access to information when dealing in different jurisdictions. For example, any exchange of information over an American messaging service is considered to have taken place on American soil.

SYNTHESIS

IN ORDER TO PROTECT ASSET VALUE AND TO ALIGN PORTFOLIOS WITH THE 2°C PATHWAY, IN LINE THE ECOLOGICAL TRANSITION, CLIMATE RISK ANALYSIS MUST BECOME AN INTEGRAL PART OF THE DECISION-MAKING PROCESSES OF ECONOMIC AND FINANCIAL PLAYERS. THE RISKS MUST BE UNDERSTOOD AND ANALYSED BY RISK MANAGEMENT TEAMS AND GOVERNING BODIES, BASED ON RELEVANT INDICATORS AND ROBUST METHODS, TOGETHER WITH SUITABLE QUALITATIVE ANALYSIS.

Partie 2

***Mapping
physical and
transition
climate risks
evaluation
methods for
financial
portfolios***

MAPPING PHYSICAL CLIMATE AND TRANSITION RISK ANALYSIS METHODS FOR FINANCIAL PORTFOLIOS

RISK SCORING

427

Exposition scores from 0 to 100, highlighting attention areas.
Modelling based on IPCC data and scenarios, with highly accurate geographical detail.
Bottom-up risk visualisation for infrastructures, companies, geography, sector, portfolio.

FOCUS PHYSICAL RISK

CDP

Climetrics

Risks and opportunities
Funds rated from 1-5
Based on a voluntary questionnaire

CARBONE 4 - CRIS

Climate risk score from 0 to 100, multi-hazard, over 3 IPCC scenarios.
Transparent method based on IPCC data and sectoral vulnerability matrices.
Large universes of corporates and sovereign, application to real assets.

FOCUS PHYSICAL RISK

I Care & Consult

0 to 100 based on geography and supply chain analysis.
Corporate, Sovereign, Real estate, infrastructures

Beyond Ratings (LSEG) - CLAIM

Sovereign bonds portfolio analysis

GREEN/BROWN SHARES

Bloomberg

ESG Data

For sovereign: % low-carbon energy / fossil fuels in primary consumption

Turnover contribution to Sustainable Development Goals
Exposition to fossil fuels (% revenues, capex, reserves)

% revenues with a sectoral approach

FINANCIAL METRICS

UNEP FI - TCFD Banking Pilot

Test project with 16 international banks on the expected loss in case of counterpart default, notably due to climate hazards.

Acclimatise

Shock propagation model from climate hazard to financial impact
Implies a mobilization of the teams that enables sensitivisation

FOCUS PHYSICAL RISK

Oliver Wyman, Mercer

Impact of demand changes and price elasticity on counterparts (revenues and balance sheets)
Mobilizes sectoral experts

FOCUS TRANSITION RISK

Volatility and Value-at-Risk for equity, spread and market values for bonds, based on macroeconomic scenarios and qualitative analysis

ALIGNMENT SCORING

Sycamore AM,

I-Care & Consult, Quantis

Net Environmental

Contribution

Climate and ESG evaluation of sovereign bonds and corporates
Convert public policy and carbon performance into warming trajectories

Classifies companies in function of their positive or negative contribution to the energy and ecological transition on a scale from -100 to 100
Internal analysis capacity
Pedagogic tools in free access

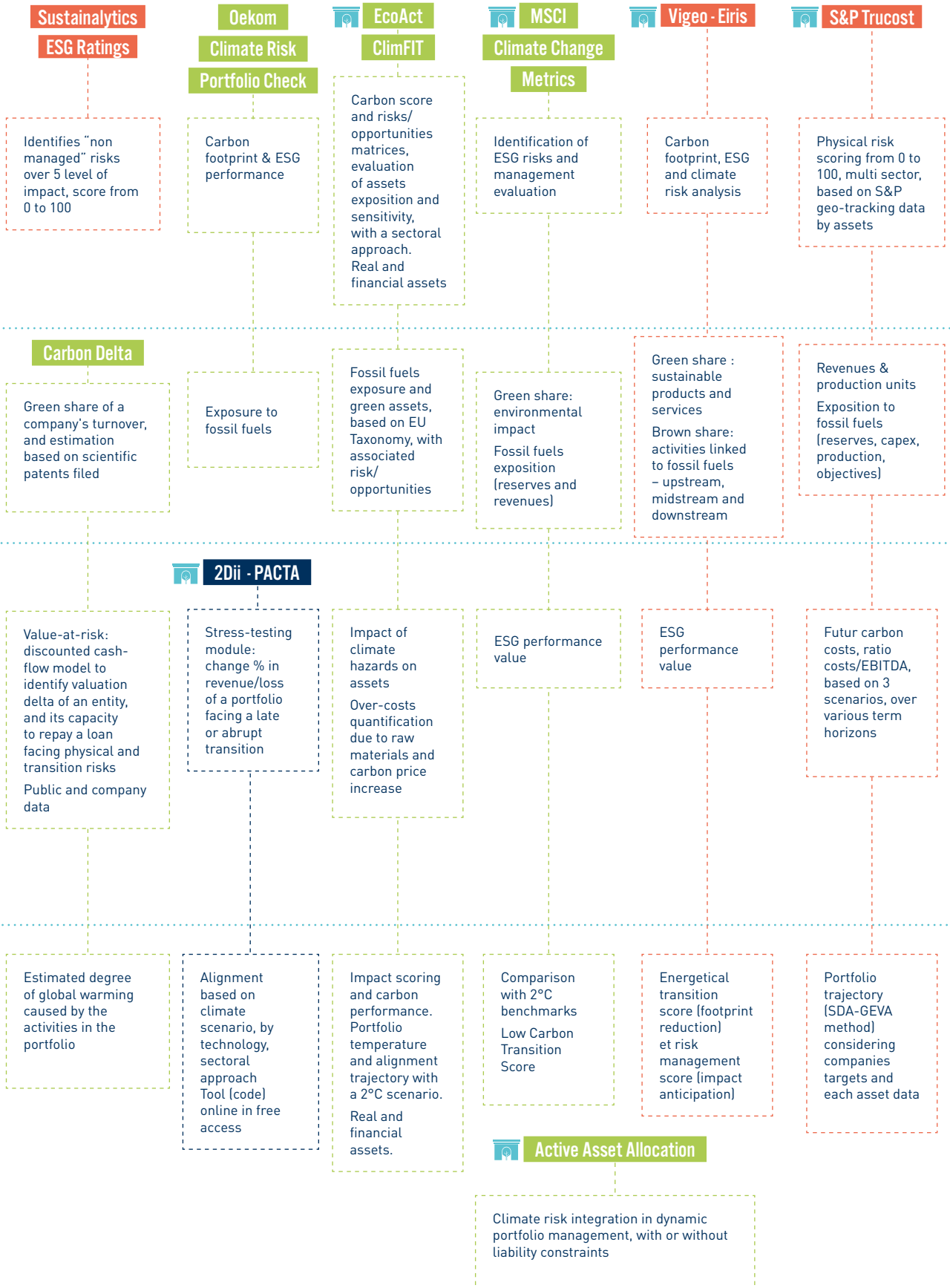
CARBONE 4

Carbon Impact Analytics

Portfolio warming scenario and asset scoring, based on bottom-up analysis based on carbon footprint (scopes 1 2 and 3), avoided emissions and a qualitative analysis of the strategy.
Companies, Sovereigns, Green bonds, possible applications to real assets

Carbon budget ratio and portfolio temperature, with 2°C alignment analysis

This map lists the main analysis methods for exposure to climate risk, physical risk and transition risk for investment and credit portfolios. It is based on existing publications (see French Insurance Federation, I4CE → Bibliography page 23) and feedback from "Investor-Corporate" workshops with members of the Climate Risk-Methodologies project group from Finance for Tomorrow



RISK SCORING

GREEN/BROWN SHARES

FINANCIAL METRICS

ALIGNMENT SCORING

Partie 3

Regulatory perspectives

French level

Since the early 2000s and in particular ahead of the COP21 in 2015, the French authorities have been working with private parties to consider the relationship between regulations, the disclosure of non-financial information, and the development of sustainable financial products. This virtuous public-private dialogue has had a positive effect for the development of a pioneer ecosystem.

ARTICLE 173-VI OF THE 2015 ENERGY TRANSITION FOR GREEN GROWTH LAW

establishes transparency obligations for investors concerning their environmental and social impact

This innovative and pioneering legislation promotes transparency over the impact of investments on the climate. The implementation of the framework is based on a “comply” or “explain” approach.

A FIRST PROGRESS REPORT

Has been carried out by the Ministry for Economy and Finance and the Ministry for the Ecological and Solidarity Transition, in collaboration with the ACPR and AMF. It provides a qualitative and quantitative analysis of the 48 largest financial actors: 30 management companies, 15 insurers and 3 public institutional investors. There is still a certain degree of variation in how the law is being interpreted and applied. Likewise, the risk and impact analysis methods used are still diverse. In addition, these analyses, although they go beyond the specific area of CSR, have not yet been sufficiently integrated at governance level or by risk management teams.

MAIN RESULTS (% of institutions)

- 50% publish all mandatory information required by the law.
- 44% publish information but to an insufficient degree.
- 6% do not publish with no explanation for their non-compliance.
- 40% mention climate risk (mandatory element based on type of entity).
- 35% mention the notion of “alignment”..

EXAMPLES OF GOOD PRACTICE

- List of main ESG indicators, distinguishing between E, S and G.
- Predicted changes to the entity's strategy and the work required.
- Analysis of the potential negative financial impact of an ESG risk on an asset.

EVOLUTIONS TO COME

The French regulatory framework will be adjusted to bring it in line with the new European Disclosure regulation (see page 23). It will be extended to credit institutions for their portfolio management activities and will cover due diligence procedures and impact analyses. However, the “stricter” national rules will be maintained, such as contribution to the ecology transition, indicative targets consistent with the National Low-Carbon Strategy and climate-specific risk management.

NON-FINANCIAL PERFORMANCE REPORTING (DPEF)

The “Déclaration de Performance Extra-Financière” consists in publishing a statement of the primary CSR risks associated with the activity.

This new regulatory obligation was borne from the transposition of the European non-financial reporting directive.

The statement covers 4 areas: social responsibility and treatment of employees, environmental protection, anti-corruption and respect for human rights. It must include a presentation of the business model, an analysis of the main CSR risks, the policies and due diligence procedures applied, and the results of the policies along with performance indicators.

The obligation applies to public limited companies with over 500 employees, both listed (€20m balance sheet or €40m turnover) and non-listed (€100m balance sheet or €100m turnover)

European level

In December 2016, the European Commission set up a High Level Expert Group (HLEG) to foster the development of sustainable finance in capital markets. The HLEG published its recommendations in January 2018, establishing the world's most ambitious roadmap for aligning the financial ecosystem with the targets of the Paris Agreement. In March 2018, following a public consultation, the Commission published its Action Plan on Sustainable Finance and set up a technical expert group (TEG) to assist in its implementation.

10 STRATEGIC PRINCIPLES OF THE EU ACTION PLAN ON SUSTAINABLE FINANCE:

<p>①</p> <p>ESTABLISHING AN EU CLASSIFICATION SYSTEM FOR SUSTAINABILITY ACTIVITIES (TEG REPORT, JUNE 2019)</p>	<p>②</p> <p>CREATING STANDARDS AND LABELS FOR GREEN FINANCIAL PRODUCTS (IN PROGRESS; GREEN BOND STANDARD; EU ECOLABEL)</p>	<p>③</p> <p>FOSTERING INVESTMENT IN SUSTAINABLE INFRASTRUCTURE PROJECTS</p>	<p>④</p> <p>INCORPORATING SUSTAINABILITY WHEN PROVIDING FINANCIAL ADVICE</p>	<p>⑤</p> <p>DEVELOPING SUSTAINABILITY BENCHMARKS (TEG REPORT, JUNE 2019)</p>
<p>⑥</p> <p>INTEGRATING SUSTAINABILITY IN RATINGS AND MARKET RESEARCH</p>	<p>⑦</p> <p>CLARIFYING INSTITUTIONAL INVESTORS' DUTIE</p>	<p>⑧</p> <p>INCORPORATING SUSTAINABILITY IN PRUDENTIAL REQUIREMENT</p>	<p>⑨</p> <p>STRENGTHENING SUSTAINABILITY DISCLOSURE AND IMPROVING ACCOUNTING RULE-MAKING</p>	<p>⑩</p> <p>FOSTERING SUSTAINABLE GOVERNANCE AND ATTENUATING SHORT-TERMISM</p>

CURRENT REGULATORY LANDSCAPE AND IMPACT ON CLIMATE RISK MANAGEMENT

SUSTAINABILITY-RELATED DISCLOSURES IN THE FINANCIAL SERVICES SECTOR

Council/Parliament reached a political agreement in March 2019 on a proposal for regulation concerning transparency of sustainable investments and climate risk. It requires financial players (bankers, investors, insurers, investment advisors) to publish information about their strategies for incorporating CSR criteria into their climate risk management, using relevant indicators and stating the analysis methods used, for example to quantify the potential financial impact on the value of their assets. The purpose is to make information more easily accessible to clients and thus increase demand for sustainable products. The European supervisory authorities are required to develop regulatory technical standards and the competent national authorities will have a duty to ensure financial actors apply the scheme

TECHNICAL CONSULTATIONS WITH THE EUROPEAN SUPERVISORY AUTHORITIES

In July 2018, the Commission asked the financial control authorities EIOPA (insurance and occupational pensions) and ESMA (financial markets) to produce recommendations for revisions to the UCITS, MiFID, AIFM, Solvency II and ID Directives. In their April 2019 reports, the authorities recognised climate risk as a key issue for prudent management.

CLASSIFICATION SYSTEM FOR SUSTAINABLE ECONOMIC ACTIVITIES

The TEG has produced recommendations for technical screening criteria to define "green" economic activities, at European level. This Taxonomy will be used to develop standards, labels and regulations. It will allow investors to describe the extent to which they fund green activities. Based on the NACE industrial classification system, it covers over 90% of greenhouse gas emissions in Europe. The Taxonomy establishes six environmental objectives (climate change mitigation and adaptation, water, circular economy, pollution and ecosystems) and an assessment process for ensuring any economic activity complies with the principle to 'do no significantly harm' the other environmental objectives

Central Banks and Supervisory Authorities

In mainstreaming sustainable finance, finance cannot replace policymakers but it can help. And as a central banker and supervisor, the Banque de France is determined to help. This is why we initiated the Network of central banks and supervisors for Greening the Financial System (NGFS), during the One Planet Summit on December 2017". (Speech by François Villeroy de Galhau, Governor of the Banque de France: Climate Risk – A Call to Action, 17 April 2019).

If the responsibility for halting global warming lies primarily with the governments that signed the Paris Agreement, coordinated international action by the central banks and supervisors appears crucial to mobilise the financial system and encourage the orderly development of green finance. This is what motivated the Banque de France to launch, alongside seven other central banks, the Network of central banks and supervisors for Greening the Financial System, which now has 42 members across five continents. Banque de France houses the permanent Secretariat and steers around fifteen experts within the network's three working groups. The NGFS is a coalition of will to share best practices on a voluntary basis, contributing to the development of environment and climate risk management in the financial sector and mobilising mainstream finance to support the transition toward a sustainable economy. The first report of the NGFS, "A Call for Action", published in April 2019, specifically recognises that climate risks pose a challenge to financial stability and issues six non-binding recommendations.

RECOMMANDATIONS	ACTIONS DE LA BANQUE DE FRANCE ET DE L'ACPR
① Integrating climate-related risks into financial stability monitoring and micro-supervision	The ACPR is working toward the integration of climate-related risks into day-to-day prudential supervision
② Integrating sustainability factors into own-portfolio management	The Banque de France has adopted a Responsible Investment Charter
③ Bridging data gaps	
④ Building awareness and intellectual capacity and encouraging technical assistance and knowledge sharing	The Banque de France provides the Secretariat for the Central Banks and Supervisors Network for Greening the Financial System (NGFS)
⑤ Achieving robust and internationally consistent climate and environment-related disclosure	The Banque de France published its first Responsible Investment Report in March 2019
⑥ Supporting the development of a taxonomy of economic activities	The Secretariat to the NGFS contributes to the activities of the European Commission Technical Expert Group that is notably working towards developing an appropriate taxonomy

Source : "Revue de Stabilité Financière n°23 - Verdir le système financier, la nouvelle frontière", June 2019

The NGFS plans to continue its research into three areas, namely climate and environmental risk management, scenario-based risk analysis and best practices for incorporating sustainability criteria into central banks' portfolio management. The aim is to provide central banks and supervisors with relevant tools and methods for identifying, quantifying and reducing climate risks in the financial system.

Part 4

Fact Sheets

Investor-

Corporate

Dialogue

Disclosure - Carbon footprint

A CERTIFIABLE INTERNATIONAL STANDARD - ISO 14064(2018)

It specifies the "principles and requirements at the organisation level for quantification and reporting of greenhouse gas (GHG) emissions and removals. It includes requirements for the design, development, management, reporting and verification of an organisation's GHG inventory". The International Organization for Standardization (ISO) provides certification for this standard.

GHG ACCOUNTING METHOD (2018):

- 1 Define the organisational boundary (using the control approach, capital share approach or other) and the reporting boundary (the entity must identify its direct GHG emissions and removals and its significant indirect emissions).
 - The chosen significance criteria must not exclude substantial quantities of indirect emissions.
 - France: This standard allows French companies to comply with article 173 of the Energy Transition Law (see page 22).
- 2 Use a documented process to identify GHG sources and sinks.
- 3 Select and justify a quantification method (e.g. Bilan Carbone® or GHG Protocol).
- 4 Gather activity data and select the GHG emission and removal factors in order to calculate emissions
- 5 The ISO standard contains a chapter to encourage emissions reduction targets setting and associated action plans.

EMISSIONS QUANTIFICATION METHODS: BILAN CARBONE® AND THE GHG PROTOCOL

CRITERIA	BILAN CARBONE®	GHG PROTOCOL
DEVELOPER	ADEME (2004) then ABC (2011)	WBCSD and WRI, represented by EPE in France
SCOPE	International	International
ORGANISATIONAL BOUNDARY	Site-based approach - Consolidation under ISO14064 and GHG Protocol rules	Two methods: <ul style="list-style-type: none"> • Capital share • Control (operational or financial)
OPERATIONAL BOUNDARY	<ul style="list-style-type: none"> • Historically: flows vital to and produced by the company • Exemptions possible under ISO 14046: Scopes 1, 2 & 3 • Scope 3 left to company discretion 	<ul style="list-style-type: none"> • Scope 1, scope 2, scope 3 • Choice of scope 3 categories on which companies report at their discretion • Each scope 3 category has a minimum boundary
TOOLS	Single packaged Excel tool	<ul style="list-style-type: none"> • Set of Excel sheets, some sector-specific • Not yet a single packaged tool • Possible exemptions compatible with GHG Protocol based on the Bilan Carbone® tool
EMISSION FACTORS	Highly detailed set of EF: ADEME's Base Carbone®	<ul style="list-style-type: none"> • Limited EF • Mainly for energy emissions
QUALITY ASSURANCE	Assessment and description of uncertainties	<ul style="list-style-type: none"> Guides to improve data quality and quantify uncertainties • Proposal for independent verification

Source: "The Big eBook of Sustainability Reporting Frameworks", EcoAct, 2019

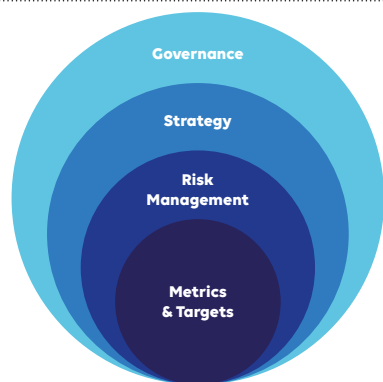
Disclosure - Information and reporting

NON-FINANCIAL REPORTING FRAMEWORKS

FRAMEWORK	TYPE	DESCRIPTION	USAGE	CONTENT AND ISSUES
TCFD	RECOMMENDATIONS	Encourages better acknowledgement of climate-related risks and opportunities by companies and financials	+800 institutions	Governance/strategy/risks/targets and indicators
CDSB	Principles	Reference principles for measuring impact on financial performance, based on international systems (TCFD, IASB, IFRS etc.)	approx. 400 companies	Impacts: environment and climate, capital and corporate activities (governance, strategy, future performance)
ONU Global Compact	Principles	10 principles to encourage companies to adopt socially responsible practices approx. 9000 companies	approx. 9000 companies	Human rights/international labour standards/environment/corruption
GRI	Framework (indicators)	Based on international standards with obligations and recommendations	38% FTSE 100; 90% CAC 40	3 universal standards + social and environmental factors by sector, with supplier assessment
SASB	Framework (indicators)	Focused on financial issues to provide information about risks and opportunities	50 companies from the SASB alliance	Dimensions: environment, share capital, human capital, innovation, governance
CDP	Database	Run by investors, focused on voluntary questionnaires to collect data	+7000 companies, +535 investors, +600 cities	Four subject-based questionnaires (climate change, water, forests, supply chain) plus sector-specific questions
EcoVadis	Database	Collaborative platform for assessing sustainable development performance of suppliers (companies)	At request from clients	ESG criteria for supply chains
UN PRI	Database	Aimed at investors, frameworks of environmental, social and governance indicators	Investor signatories of the PRI	12 modules, both general and by asset class

Source: adapted from work by EcoAct, 2019 and the report "Guaranteeing the relevance and quality of corporate non-financial reporting", De Cambourg, 2019

TASK FORCE ON CLIMATE RELATED FINANCIAL DISCLOSURE



Created in 2015 by the Financial Stability Board (FSB), the TCFD initiative has come the closest yet to promote global convergence on climate-related reporting. It recommends adopting a forward-looking vision, based on transition scenarios..

THE 400+ FINANCIAL SUPPORTERS OF THE TCFD (2019) REPRESENT:

+\$107 TRILLION ASSETS UNDER MANAGEMENT

+\$8,000 BILLION MARKET CAP

REPORT "GUARANTEEING THE RELEVANCE AND QUALITY OF CORPORATE NON-FINANCIAL REPORTING".

Report submitted by Patrick de Cambourg, President of the French National Accounting Standards Authority, to the Minister for the Economy and Finance, in June 2019. The author highlights the strong dynamic towards transparency of non-financial information. However, there are numerous obstacles in terms of operational difficulties, poor quality information and lack of coherence between initiatives. He points out the need for convergence at each level (international, European, national), associated with a granularity suitable for combining excellence, optionality and proportionality.

4 recommendations for a standardised framework

① quality and classification principles ; ② comprehensive framework incorporating the SDGs with complementary sector benchmarks ; ③ reporting structure and nomenclature ; ④ governance framework for non-financial information.

FACT SHEET N°3

Alliances & coalitions



FOCUS CLIMATE ACTION 100+ :

Investors initiative to ensure the world's largest corporate greenhouse gas emitter's take necessary action on climate change. In 2019, more than 360 investors with more than \$34 trillion in assets under management have signed onto the initiative.

FACT SHEET N°4

Strategy - ACT methodology

CREATION DATE

2015

FOUNDING INSTITUTIONS

ADEME, CDP;

Part of UNFCCC Global Climate Action (GCA) Agenda

ACT® has created a sectoral framework and methodologies for reporting to assess how a company's climate-related actions and strategies contribute to achieving the emissions reduction targets set by the Paris Agreement. The ACT® assessment and related score are designed to:

- provide independent, verifiable information about how companies are tackling the transition to a low-carbon economy;
- provide independent information about how companies are aligning their strategies and climate-related performances with their sector's zero-carbon pathways.
- help companies understand their sector's zero-carbon pathways in order to anticipate the associated transition risks;
- provide an independent assessment to help companies disclose relevant climate information in respect of the TCFD recommendations;
- motivate companies wishing to accelerate their switch to a zero-carbon business model.

METHODOLOGIES :

The ACT® methodologies are free to access on its website (<http://actproject.net>). They each come with their own assessment tool, available under licence. They are based on analysing a company's past, present and projected future strategy, focusing on specific elements such as material and intangible investments, and business model.

1. SECTORS COVERED

The methodologies are developed by technical working groups (TWG) comprised of relevant stakeholders such as companies, sector federations, experts, consultants and researchers.

They currently cover electric utility, auto manufacturing and retail. The ACT® Building Sector (construction and real estate) methodology was completed in early 2019 and is currently in a pilot phase. Over the three years starting in September 2019, the initiative plans to develop methodologies for the oil and gas, transportation and cement sectors. 2020: Agriculture, agrobusiness, chemicals (ethylene, ammonia, chlorine) methodologies, as well as a multi-sector generic ACT methodology for sectors not covered by the TCFD recommendations and the large number of cross-sector companies. 2021: Metals (aluminium, steel), paper, glass.

2. ASSESSMENTS

ACT® assessments are conducted:

- either by the companies, with or without the support of ACT®-trained consultants with a user licence. The results are independently verified.
- or at the request of the founders of the ACT® initiative, in order to produce sector-based reports

FACT SHEET N°5

Strategy - Science Based Targets

CREATION DATE

2014

FOUNDING**INSTITUTIONS**

Partnership between the CDP, UN Global Compact, World Resources Institute and WWF, in collaboration with the We Mean Business coalition.

The Science-Based Targets (SBT) initiative aims to promote the adoption by companies of carbon strategies aligned with the targets of the Paris Climate Agreement.

PARTIES INVOLVED:

- Companies: set greenhouse gas (GHG) reduction targets
- Investors: align their investment portfolios with climate targets
- Governments interested in climate change mitigation actions developed by the private sector

RÉSULTS:

- So far, 566 companies have publicly committed to setting climate-related targets using the Science-Based Targets method, of which 200 have already set GHG reduction targets in line with the Paris Agreement.
- Of them, 38 financial institutions have publicly agreed to set Science-Based Targets and align their investment portfolios with the Paris Agreement.

FACT SHEET N°6

Strategy - Initiative Climate 2020

CREATION DATE

2015

FOUNDING**INSTITUTIONS**

Ardian, Apax, Eurazeo, LBO France and PAI Partners set up the Initiative Climate 2020 which is now a working group of France Invest's ESG Commission.

The IC20 is an initiative from the investment capital sector to support the creation of companies that respect human rights and the environment to support the Paris Agreement.

PARTIES INVOLVED:

- Non-listed portfolio holdings: start-ups, VSE, SME, MSE.
- In 2018, the PRI expressed support to the project, in order to disseminate the TCFD recommendations among non-listed companies.

METHODOLOGIES:

- Investment phase: assessment of sustainability issues in the future growth of the company.
- Holding phase: training of management teams on climate-related issues; materiality analysis of the company's carbon footprint. Depending on the specific issues, further calculations and support for the company's management to produce an emissions reduction and climate change adaptation plan.
- At exit: assessment of significant progress made.

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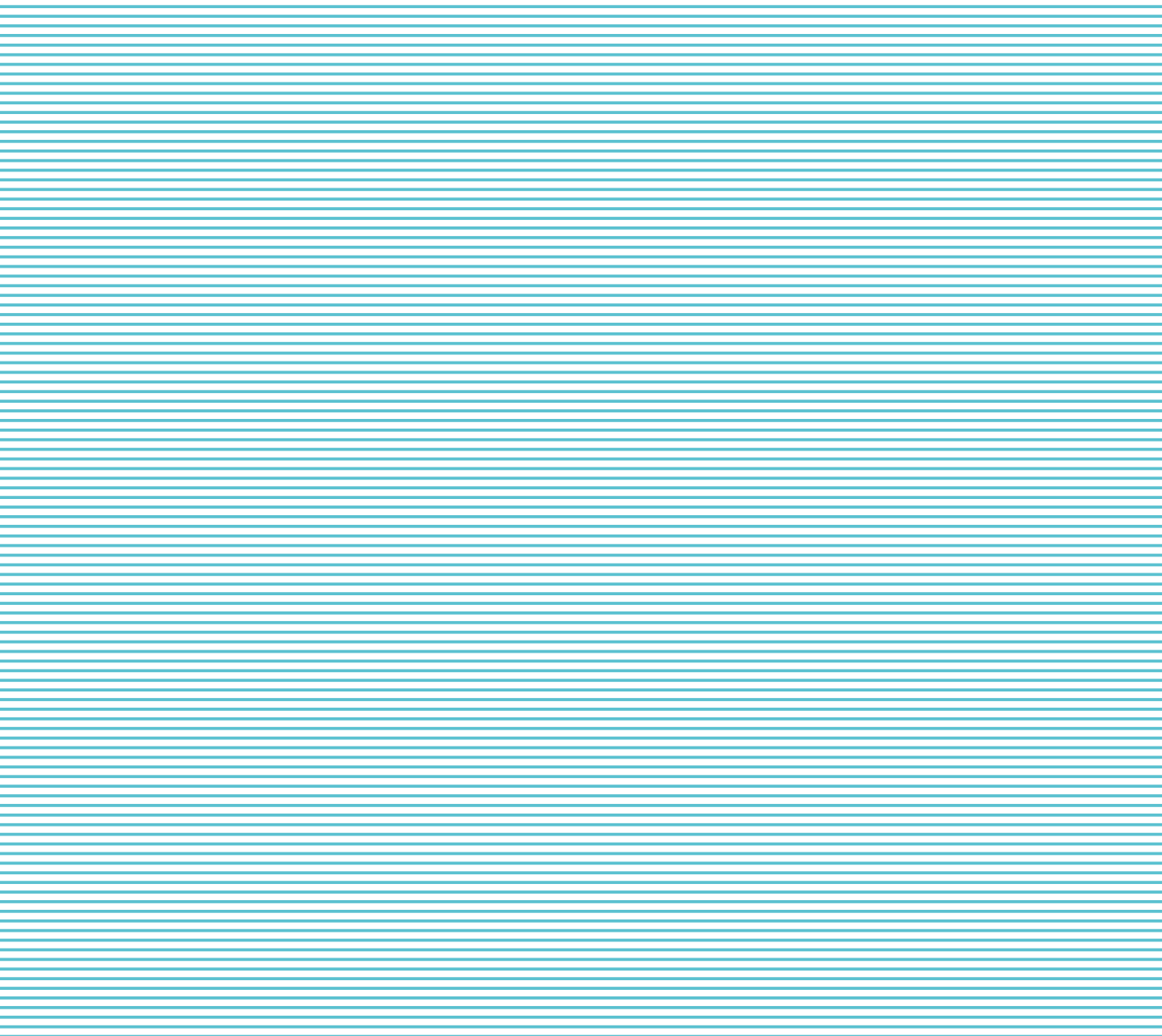
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