

FEBRUARY 2018

CLIMATE RISK ANALYSIS

STAKEHOLDERS, METHODOLOGIES AND OUTLOOK

REPORT BY THE SHIFT PROJECT THINK TANK FOR AFEP



Foreword

Objectives of the study carried out by *The Shift Project* for AFEP

This study grew out of an atmosphere of feverish change, with ever-increasing international mobilisation, around climate issues in particular. The fast pace of change is exemplified by the Paris Agreement of late 2015, the entry into force of article 173 of the LTECV (Energy Transition for Green Growth Act) in France, and the work of the Task Force on Climate-related Financial Disclosures (TCFD) set up by the Financial Stability Board (FSB). These developments are impacting more and more upon the activities and the strategy of major French companies.

In particular, the specific nature of climate risk is taking on a greater urgency for most economic actors (investors, regulators, markets), with climate becoming a more clearly demarcated issue, distinct from the categories ordinarily covered by ESG (Environmental, Social and Governance) criteria.

This is fertile ground for a proliferation of climate-change-related risk analysis methodologies that reflect the complexity of the subject, and for the emergence of new company assessment standards which until now have been mainly based on financial indicators alone.

With this in mind, AFEP, which represents 120 major private groups operating in France, asked *The Shift Project* to conduct a study to inform the debate around these issues, and to provide companies with tools, giving them a better insight into the situation they are facing with regard to climate risk analysis.

Specifically, we have endeavoured to:

- **Map out the main climate risk analysis methods** that could be used – or are already in use – by companies and investors.
- **Produce as comprehensive an analysis as possible** of the main stakeholders in climate risk assessment, their methodological choices, and the main areas of focus in the market.

Structure of the study

The results of this study are largely based on meetings the project team managed to arrange with most of the stakeholders involved in climate risk analysis: extra-financial rating agencies, credit rating agencies, data providers, financial professionals, index providers, and public and quasi-public organisations.

In order to cover all the issues raised by these complex questions and to maintain objectivity, the main thrust of our work was threefold:

- **Several meetings with AFEP companies** in order to better understand the questions they are asking themselves about the major players in climate risk assessment, and to develop with them a framework for analysing stakeholders that most accurately reflects their concerns.
- **A meeting with rating stakeholders** in order to shed light on how they handle climate risk analysis and on their governance, and to give them the opportunity to answer questions raised by issuers. These discussions were centred on the analytical framework developed with AFEP member companies.

- **A meeting with public organisations (regulatory bodies), national think tanks** (Observatory on Corporate Social Responsibility – ORSE) and **international think tanks** (Task Force on Climate-related Financial Disclosures - TCFD, High-Level Expert Group on Sustainable Finance - HLEG) to garner their views about the main subjects addressed in this study and about the changing national and international regulatory context.

Our analysis also drew heavily from the extensive literature which is available on the subject (listed in the appendix to this report, p.56).

About this report

The conclusions in this report are presented under the sole responsibility of *The Shift Project*.

We apologise in advance for any inaccuracies or omissions. There was unfortunately not enough time to meet with all the relevant stakeholders.

We also took account of the fact that although the consequences of climate change affect all sectors, some are more directly affected than others, and this changes the way they are handled.

Quite apart from the complexity and reach of climate risk analysis, it is a fast-changing field. As such, this study would be worth following up over time in order to keep pace with the developments that are bound to occur.

About *The Shift Project*

The Shift Project is a public-interest organisation established in 2010 by Jean-Marc Jancovici (co-founder of Carbone 4). It is a think tank set up to inform and influence the debate around the energy and climate transition in France and Europe.

As of 2017, *The Shift Project* is funded by a number of major French and European companies (Spie, EDF,

SNCF Saint-Gobain, Vicat, Vinci Autoroutes, Bouygues, Rockwool, Thalys, Caisse des Dépôts) that want to turn the energy transition into a strategic priority, and helps them identify related opportunities.

Since it was created, *The Shift Project* has developed 20 research projects, helped to establish two international events (Business and Climate Summit, World Efficiency), and organised 50 seminars, forums, workshops and conferences. It has had a significant influence on several major political decisions about the energy transition in France and within the European Union.

The Shift Project has a unique analytical approach based on the conviction that energy is an extremely important development factor and the risks arising from climate change, which are closely linked to the use of energy, have a particular systemic and transdisciplinary complexity.

The Shift Project has completed a number of projects closely related to the subject of this study. Examples include:

- **"Observatory 173 on Climate & Life Insurance"**, assessing the way climate risks are taken into account and managed by the life insurance sector in France in the context of article 173 of the LTECV.
- **"Price of Carbon"**, suggesting ways to boost the CO₂ allowance price signal in the EU Emissions Trading Scheme (EU ETS).
- **"Link between Energy and GDP"**, research project by Zeynep Kahraman and Gaël Giraud¹ aiming to establish a causal link between energy and GDP.

The study also benefited from the support and expertise of Global Warning, a consultancy established by Michel Lepetit.

¹ Gaël Giraud, Zeynep Kahraman. *How Dependent is Growth from Primary Energy? The Dependency ratio of energy in 33 Countries (1970-2011)*. Documents de travail du Centre d'Economie de la Sorbonne 2014.97 - ISSN: 1955-611X. 2014.



About AFEP

AFEP stands for *Association française des entreprises privées* (French association of large companies). It was established in 1982 and its members are the largest French multinational companies. It is based in Paris and Brussels. Its objective is to help create a favourable environment for the development of sustainable economic activity, and to advocate its member companies' vision to the French authorities, European institutions and international organisations. AFEP has 120 member companies with a workforce of more than 2 million in France and 8.5 million throughout the world. Since the year 2000, it has been vocal on climate, environment and energy issues. Concerning climate, alongside its work on major legislation (such as the directive on ETS and French legislation), it has recently launched a number of initiatives with the support of major French groups and the French authorities:

- Working with French companies and national authorities, it has created an innovative French service for sustainable urban planning with 20 or so demonstration projects, nationally and for export, aiming to reduce energy, climate and environmental impacts and to improve the quality of life.
- It has introduced voluntary commitments from companies relating to the circular economy, with a positive impact on the climate in particular.

AFEP is working on climate reporting issues for companies and on ways to strengthen the dialogue between investors and companies, major groups and SMEs in their search for new low carbon solutions.

The Chairman of AFEP is Laurent Burelle, Chairman and CEO of Plastic Omnium.



Acknowledgements

We would first like to thank AFEP member companies for sharing their experience of climate risk assessment practices. We would also like to thank AFEP for trusting us throughout the study. Our sincere thanks go to all participants² for being so welcoming and for giving us such high quality information:

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- **Nicolas BLANC** (Deputy Director of Strategy), Caisse des Dépôts)
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- **Jean BOUQUOT** (President, CNCC)
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¹ The appendix to the report contains a list of participants arranged by category.

Key findings of the study

Climate risk is urgent, global, systemic and irreversible in nature, and closely linked to the use of fossil fuels which are omnipresent factors in economic development. It can be broken down into a **"physical risk"**, for example arising from an increase in abnormal natural phenomena, and a **"transition risk"**, arising from the requirement for businesses and government to limit greenhouse gas emissions.

Climate as an issue received a momentum boost after COP21 and the signing of the Paris Agreement in December 2015. The world of finance, in particular, is exerting pressure (small at present but constantly growing) on companies to prepare for climate risk, developing their strategies and their reporting accordingly.

Even so, **many investors still do not fully understand the potential impact of climate change** on corporate strategy. There are concerns around the maturity and relevance of the climate risk approach, the wide range of analysis methods used, and the position occupied by climate reporting.

For many years, climate as an issue was embedded in the wider ESG analysis (Environmental, Social and Governance), **but is increasingly being treated as a distinct issue** by risk analysis and rating organisations. **This separation is expected to pick up pace** because of the materiality of the risk, the fact that it can be quantified, its systemic dimension, the very worrying increase in global greenhouse gas emissions, and finally also because of international commitments that might severely limit anthropogenic emissions in future.

Analysis of the risks and opportunities of "low carbon" strategies requires considerable expertise and resources.

As well as assessing direct or indirect greenhouse gas emissions, **analysis methodologies increasingly need to factor in the dynamic and prospective nature of the strategies used.** Conceptually, this is a big step forward, but when "low carbon" scenarios are applied to an activity, it is very difficult to determine how best to design and assimilate these scenarios.



Despite considerable progress, therefore, the importance of the “climate rating” remains limited to this day. Climate risk is only slowly and partially being integrated in the mainstream analyses and research of the major credit rating agencies. As for the extra-financial rating agencies, their analyses are focused on assets for which there is a specific demand (still very small) among final investors (green bonds, SRI – Socially Responsible Investment – funds, low carbon indices).

The climate rating sector, like the entire ESG sector, is characterised by a lack of funding which 1/ delays the inclusion of systemic risks linked to climate change, 2/ inhibits R&D in this field, 3/ encourages simplification and automation of the analysis, 4/ raises governance issues and reduces trust among the stakeholders.

In the financial world there is a temptation to use excessively simple investment portfolio qualification methodologies. The resulting analyses are simplistic and static. These approaches are methodologically fragile and should only be a small part in helping the markets take account of climate risk in an effective way.

The issue of climate is destined to become ever more central, and there is a notable consensus in French political and financial circles on the gravity of the situation. Out of this, a long-term national ambition is able to emerge. France has already almost completely decarbonised its electricity production and passed proactive legislation, and **the country has other attributes allowing it to face climate challenge** and become a leader in the future European and global low carbon economy.



Contents

Foreword.....	3
Main findings of the study	8
Contents	11
Chapter 1 – Study context.....	12
1.1 Climate change is a complex subject.....	13
1.2 Momentum on climate	16
Chapter 2 – Ecosystem of climate risk analysis	24
2.1 Extra-financial rating agencies	26
2.2 Credit rating agencies	27
2.3 Carbon data providers and calculators	30
2.4 Index providers.....	32
2.5 Auditors	34
2.6 French public and quasi-public organisations	34
2.7 Financial backers (banks).....	36
Chapter 3 – Methodological issues	38
3.1 Carbon data and climate information	39
3.2 Analysis of carbon data and climate information	42
3.3 Scenarios.....	45
Feedback from discussions with a selection of contributing AFEP companies.....	48
Appendices.....	52
Glossary	53
List of abbreviations	54
List of participants by category.....	55
References.....	56

Chapter 1

Study context

1.1 Climate change: a complex subject

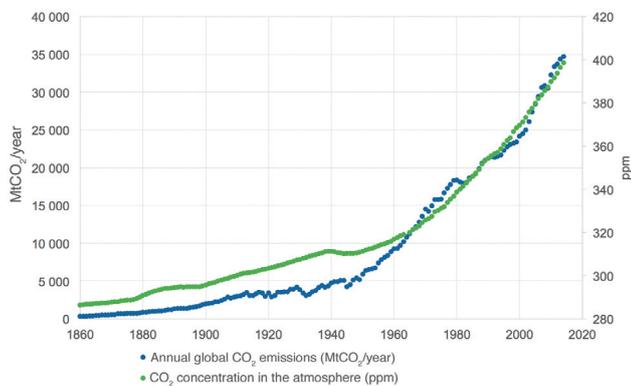
1.1.1 Energy is key to address climate issues

The issues raised by climate change and its impact on society seem to be more pressing than ever before. As if to prove the point, recent years have seen various temperature records broken with consequences that are already observable – the dramatic retreat of glaciers, the melting polar ice cap or rising sea levels. These are signals heralding profound changes in our environment.

There is now a broad consensus as to the cause of these major impacts. Climate is being warmed to an alarming degree by the emission of increasing quantities of greenhouse gases and their higher concentration in the atmosphere.

The consequences of this physical phenomenon have been known for a long time: Arrhenius's discoveries date from the late 19th century, but real scientific wor-

Change in atmospheric CO₂ from 1850 to now.



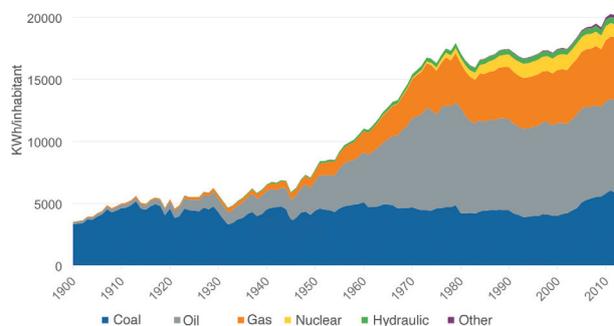
Source: WRI-CAIT and NASA

ries began to emerge in 1953³, then wider collective concerns from the late 1960s⁴, followed by virtual certainty after the Rio Summit in 1992.

The anthropogenic nature of greenhouse gas emissions, amounting to nearly 45 gigatonnes of CO_{2eq} in 2017, is no longer controversial, and is mainly due to the energy we use (35 GtCO_{2eq} in 2013⁵).

Energy has always been and still is an essential factor in the development of societies. Energy can be defined as the physical quantity which measures the change of state of a system. In other words when a transformation takes place, energy comes into play, and the quantity of energy used describes the degree of the transformation. Nothing can be produced or transformed without energy being involved in the process. This holds true for changes of temperature, shape, speed or chemical composition. As a first approximation, a human society can be seen as a system that extracts, transforms, works and transports mineral or biological resources drawn from the environment in order to produce goods and services individuals wish to consume to meet their needs.

Global consumption of primary energy per inhabitant from 1900 to 2015.



Source: TSP data portal and UN statistics division

³ "Energy in the future" by Palmer Cosslett Putnam, consultant to the United States Atomic Energy Commission, 1953 (<http://global-warning.fr/wp-content/uploads/2016/03/ENERGY-IN-THE-FUTURE-PUTNAM-1953-Note-6-1-on-climate.pdf>)

⁴ "The Historical Roots of Our Ecologic Crisis" by Lynn White, Jr. – Science, 1967

⁵ MEEM (2017). Climate data.

Accordingly, the discovery and then the increasing use of primary energy⁶ – via converters able to transform it into mechanical energy (steam engines, internal combustion engines, turbines, etc.) – and consequently the development of all the physical flows underpinning production, have played a crucial role in the economic, social and demographic expansion of human societies and in the growing productivity of work as it is classically measured.

This expansion burgeoned throughout the world in the 19th century thanks to the discovery and use of vast quantities of hydrocarbons. The physical characteristics (especially the calorific value), high accessibility, abundance and therefore the relatively low price of these energy sources explain why they became so prevalent in all sectors of the economy. The process began with coal (in the first industrial revolution⁷ which also saw the arrival of electricity at the end of the 19th century), but energy consumption increased very significantly from the end of the 1940s with oil and gas (the second industrial revolution). In 2015, global consumption of primary energy was 13,150 Mtep, of which 32% was oil, 23% gas and 30% coal⁸.

For nearly 200 years, our societies have used the “energy” parameter to develop at an unprecedented pace. The fruits of this abundance of energy (mostly from fossil fuels) include industrial activity (essentially metalworking, cement plants and the chemical industry) and more recently digital activity⁹, land development, trade with shorter distances and times, higher agricultural yields, and perhaps most importantly social advances (material comfort, advances in healthcare,

education and safety). To illustrate this, in 2015, 85% of the primary energy consumed in the world was from fossil fuels (74% in the European Union, 81% in the OECD countries, 88% in China, 92% in India and 86% in the United States, according to the BP Statistical Review, 2016).

Massively reducing global greenhouse gas emissions to contain global warming therefore means reducing the relative consumption of energy from fossil fuels.

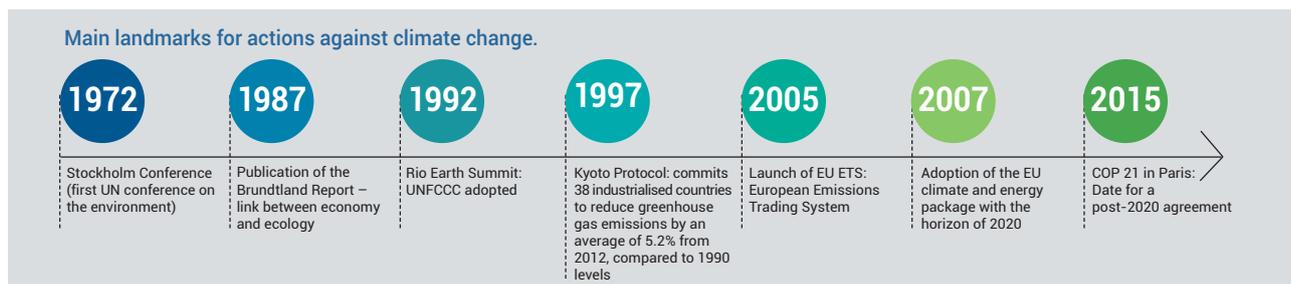
The climate problem therefore has a particular systemic and multi-sectoral complexity because it is closely linked to the use of the fossil fuels on which the development of modern societies was based, and from which it will be very difficult to wean off, bearing in mind how deeply embedded they are in all sectors of the economy.

Because it is systemic in nature, the issue of “climate” must be then analysed specifically.

1.1.2 Systemic risks within a well-defined time frame

There are very significant risks if current trends in greenhouse gas emissions continue, causing growing and irreversible damages to the planet, its inhabitants and our societies. Meanwhile, natural (forests and oceans) or artificial (carbon capture and storage) absorption mechanisms do not appear capable of compensating at sufficient scale¹⁰.

The physical disruption caused by climate change – such as the increasing frequency and intensity of

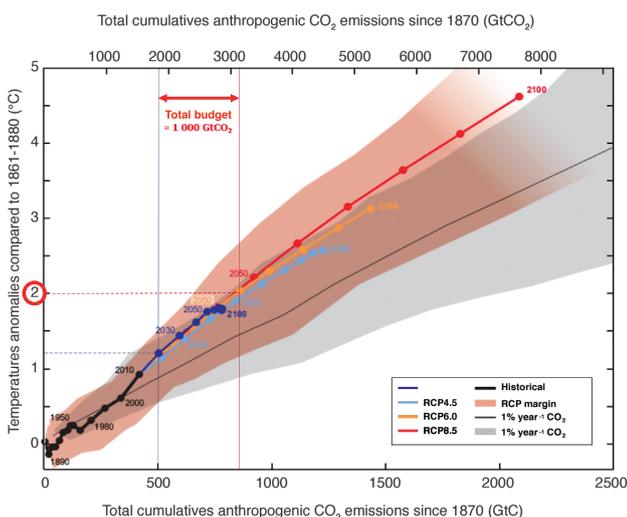


extreme weather events, local alteration of water resources, or rise in sea levels, to name just a few examples – will entail economic, political and social upheavals that are likely to be very serious¹¹. The *materiality* of the risk and the greater awareness have encouraged increasing activity (by IPCC, TCFD, IMF, etc.) to analyse the potential impacts as well as the resilience of organisations and institutions (governments, companies, etc.) and their capacity to adapt.

More specifically, limiting or adapting to climate change implies **serious transformations of our economies**, including changes in production methods and energy consumption, in order to make them operational in a “low carbon” world. The intensity and brutality of these transformations depend on how quickly they are implemented. For this reason, adaptive resilience is becoming increasingly important for companies.

The gradual mobilisation resulting from the will to mitigate and adapt to these changes culminated in the 2015 Paris Agreement. Signatory countries pledged to take action to keep the global average temperature rise below 2°C and to pursue efforts to limit the temperature increase to 1.5°C.

Emissions trajectories compatibles with a temperature increased limited to 2°C



Source: IPCC

A number of consequences flow if a limit is fixed in this way.

Accepting an upper limit to the temperature increase necessarily means allocating a “carbon budget”, in other words limiting total future greenhouse gas emissions, which according to the IPCC amount to something like 1000 gigatonnes of CO₂eq. This global “carbon budget” specifies all actions to be taken in a **well-defined time frame limited to 2050**. Greenhouse gas emissions must be reduced at a very rapid pace, depending on the chosen baseline dates.

In fact, bearing in mind climate inertia and the persistence of CO₂ surplus in the atmosphere once it has been created, it is important to note that past greenhouse gas emissions will continue to disrupt the climate in the future, regardless of the scale of the reduction policies implemented now. In other words our societies will be affected by climate change and will have to deal with the impact even if the temperature increase is successfully limited to 2°C in 2100.

The public policies adopted to limit emissions may keep some hydrocarbon reserves in the ground in order to meet the 2°C target, which might be broken if the reserves were exploited (with the associated greenhouse gas emissions). The potential loss of value of these now unusable resources (“stranded assets”) is a significant risk for the owners of the resources, and has become the first sign of the transition-related climate risk.

This is currently, at any rate, the strongest risk signal with a materiality that is clearly perceived by the market¹².

⁶ Primary energy is a form of energy available in nature before any transformation.
⁷ Note: prepared since the 16th century by the use of coal. Cf T. Wrigley - THE PATH TO SUSTAINED GROWTH - England's Transition from an Organic Economy to an Industrial Revolution - Cambridge University Press 2016
⁸ BP Statistical Review 2016
⁹ The so-called “dematerialised” economy is also a huge consumer of transformed resources, and it can only exist in an energy-hungry world.
¹⁰ The Economist, 16/11/2017 (<https://www.economist.com/news/briefing/21731386-cutting-emissions-will-not-be-enough-keep-global-warming-check-greenhouse-gases-must-be>)
¹¹ In this connection see the 5e report of the IPCC of October 2014 (http://www.ipcc.ch/home_languages_main_french.shtml)
¹² Rumoured to be the subject of a stress test by the bank supervisory authorities in November 2016

Mark Carney, in his speech entitled “Resolving the climate paradox”¹³ in 2016, explicitly mentioned this risk for coal mining and German electricity producers.

In light of the above, these subjects resonate very strongly in terms of risk because they touch upon energy, which is a key sector for the entire economy.

The oil and transport industries could be affected too, as witnessed in *Saudi Aramco’s* plans¹⁴ to bring in new investors, or the positions taken recently by several governments regarding vehicles with internal combustion engines.

More generally, there has been a change over time in the perception of climate risk, which gradually seems to be spreading from energy production to energy use. The TCFD also identifies five major sectors requiring special attention (see 1.2.2.2 Task Force on Climate-related Financial Disclosure, p.18), while itself insisting that the entire economy is affected because the subject is systemic.

1.2 Momentum on climate change issue

1.2.1 Climate risks are unique

In most analysis schemes, climate risks (physical risk and transition risk) are included in a broader group of risks known as ESG (Environmental, Social and Governance). However, climate risks have unique characteristics in terms of nature, extent and growth (see 1.1. Climate change is a complex subject, p.13):

- **First of all, the field of “climate” is relatively quantifiable on the basis of physical parameters**, unlike other fields, especially social and governance, which undergo essentially qualitative analysis and often raise “moral” considerations. The cornerstone of

climate risk analysis (essentially the transition risk) is the measurement of CO₂ emissions.

- **The issue of “climate” lends itself to the objective and tangible measurement of risk**, whereas other factors tend to be more concerned with an ethical dimension or management (sustainable development). Furthermore, the emission location is unimportant, producing a universal interdependence.
- **The irreversible, global, systemic and very long-term dimension of the issue of “climate” is not present in the other ESG factors**¹⁵. The same applies to the need for comparability over time of climate data/ climate performance.
- **Climate risks are perceived as the most mature and – in 2017 – the most urgent risks**¹⁶. Unlike most of the other ESG criteria, the issue of “climate” benefits from global recognition (ratified treaty).

For these reasons, the specific logic for analysing ESG risks does not appear to be well-suited to an accurate assessment of climate risk. This ought to encourage “climate” to become a distinct issue within ESG (like others including biodiversity or the dependence on non-renewable or non-substitutable essential resources). This phenomenon can already be observed in the privileged status given to the climate in most analyses, declarations or legislations (e.g. article 173 of the LTECV (French Energy Transition for Green Growth Act) compared to other extra-financial criteria.

Even so, it is unfortunate that the issue of “climate” remains so closely tied to its historic roots in ESG, causing analysis bias and downplaying the importance and gravity of the issue by partly reducing it to ethical considerations.

Ultimately, the very concept of “green” can cause confusion and sometimes makes it difficult for workable typologies to emerge, as illustrated by the work of the G20’s Green Finance Study Group which seems to have problems formulating an agreed definition of “green”¹⁷.



1.2.2 A faster pace since COP21

There are a number of convergent factors suggesting that national and international political and economic mobilisation around climate risk has picked up pace.

Since COP21 and the new consensus around a global “carbon budget” there has been a real proliferation of initiatives from the public and private sectors and from the “civil society”. The most striking examples are the TCFD, article 173 of the LTECV, the European Commission's “High Level Expert Group on Sustainable Finance” (HLEG)¹⁸, the various initiatives emerging from the major world cities, and the “*Laudato si*” from the Pope.

Mark Carney's speech at Lloyd's in 2015¹⁹ highlighted in a spectacular way the fast-growing awareness within the financial sector of the physical and scientific realities of climate change, its causes, and the systemic pressures brought on the financial system by the energy transition. The speech was a watershed for two reasons: the influence of the speaker, who is the governor of the world's oldest central bank and co-chairman of the FSB (the G20's Financial Stability Board); and the universality of his words which were addressed not just to the British insurers affected by the repeated flooding in Great Britain but to all financial industry stakeholders whatever their nationality²⁰.

It is reasonable to conclude from the above that a certain momentum has built up around climate risk. However, now that the United States (the second biggest producer and consumer of hydrocarbons and the second biggest greenhouse gas emitter) has left the Paris Agreement, there is uncertainty about the prospects for success and about whether the financial world will really take account of climate issues.

1.2.2.1 French regulations

Thanks to historic choices (primarily its low carbon electricity production mix) France is at the forefront in

terms of carbon policies, and the country has now gone further with the LTECV (Act on Energy Transition for Green Growth of 17 August 2015).

Article 173 of this legislation, as mentioned above, promotes better information about the climate strategies of companies, and attempts to mobilise the financial industry via institutional investors. Its adoption attracted the attention of major global players in finance such as BlackRock²¹. It is a cutting-edge piece of legislation, still unique in the world, and claims to be pragmatic in its application. It is an extension of the “*Grenelle de l'Environnement*” (2010).

Parts III and IV of article 173 are applicable to all companies (subject to certain thresholds as discussed below), and parts V and VI specifically concern financial companies: banks as well as institutional investors (insurance companies, asset managers).

¹³ <http://www.bankofengland.co.uk/publications/Pages/speeches/2016/923.aspx>

¹⁴ *Financial Times* - 08/2017 - Saudi Aramco's value at risk from climate change policies Global warming targets could reduce oil major's worth to \$940bn, says campaign group (<https://www.ft.com/content/2115e218-802e-11e7-94e2-c5b903247afd>)

¹⁵ However, there are some similarities with the issue of resources, which is also studied by The Shift Project

¹⁶ Meeting the commitments made in the Paris Agreement implies an annual reduction in greenhouse gases of around 5% starting in 2018. See “Simulation of emissions trajectories compatible with the carbon budget +2°C”, Pierre Lachaize, The Shift Project http://www.theshiftproject.org/sites/default/files/files/note_danalyse_les_indc_et_le_budget_carbone_the_shift_project_0.pdf

¹⁷ GFST – UNEPF FI – Definitions and concepts (http://unepinquiry.org/wp-content/uploads/2016/09/1_Definitions_and_Concepts.pdf)

¹⁸ See the Juncker Plan and the European Commission's proposal to allocate a very high proportion towards financing the energy transition

¹⁹ See the French translation of the speech (by Global Warning) (<http://portal.beyond-ratings.com/wp-content/uploads/2015/11/Breaking-the-tragedy-of-the-horizon-speech-by-Mark-Carney-September-2015-FR.pdf>) or the original version (<http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>)

²⁰ Mark Carney's speech outlines all the current thinking of the financial industry, and although it succeeds in raising awareness of the climate, it may be seen as limited in its analysis of the global energy issue and the constraints linked to energy.

²¹ BlackRock – Adapting the portfolios to climate change, p.7 – September 2016

The various provisions in this article are also complemented by the “climate-centred” transposition of Directive 2014/95/EU²² on extra-financial reporting, and represent a significant increase in the quantity of information that major companies are required to disclose. In particular²³:

- **The affected companies²⁴ are required to disclose in their annual management report²⁵:**

- *“Significant items of greenhouse gas emissions generated from the company’s activity, for example through use of the goods and services it produces²⁶”*

- A description of the main risks associated with the company’s activity, the implemented risk management policies and their results, supported by performance indicators²⁷, for four subjects including the *“consequences for climate change of the company’s activity and the use of the goods and services it produces²⁸”*

- *“Measures taken to adapt to the consequences of climate change²⁹”*

- *“Voluntary medium and long term objectives to reduce greenhouse gas emissions, and the related measures taken³⁰”*

- **The requirement to have the extra-financial performance declaration verified** (as true and fair) by an independent third-party body has been introduced for affected companies³¹.

The law goes further than requiring companies to disclose their carbon footprint. It introduces a dynamic dimension by referring to the risks associated with climate change and to the companies’ “low carbon” strategy.

Implementation is based on “comply or explain” approach. Companies must provide the information or give reasons why they have chosen not to. This approach leaves some flexibility to companies. Hopefully, there will be sufficient dynamism to generate the necessary general mobilisation, especially among financial organisations (management companies, life assurance companies, etc.).

The law does not impose a particular methodology or metric that must be reported by the affected companies (financial and non-financial). They are free to select the methodology or metric they think is best for their climate risk analysis. They are, however, expected to justify their choice and provide a description of the methodology.

The considerable room for manoeuvre (for example “significant items” could hardly be vaguer, and no theoretical framework is provided for risk management) suggests to us that the legislature is struggling with immature carbon footprint measurement methodologies.

The French Treasury believes that if France and Europe are to have any influence on future standards, it is essential for French non-financial companies and professional organisations to be proactive and come forward with proposals regarding carbon footprint measuring methodologies and risk analysis.

Taken together, the provisions set out in this section make the French legislation quite robust and very comprehensive in scope, allowing French companies to take the lead in “climate” information disclosure, risk management and “low carbon” strategies, and putting them one step ahead of the main international standards.

The eyes of the entire global financial industry are now on France. Article 173³² was first implemented for institutional investors in 2016, with promising results, and 2017 saw a wider rollout. Hopefully, with some encouragement, the best practices of certain major investors in France will disseminate among smaller institutions.

1.2.2.2 Task Force on Climate-related Financial Disclosures (TCFD)

Alongside a growing number of initiatives by developed and emerging countries, the work being done at international level on the financial implications of climate change revolves around the TCFD. This working group was established by the Financial Stability Board (FSB) following a request from the G20 (involving France, the



United Kingdom and the Green Finance Study Group (GFSG) launched under China's presidency of the G20). Chaired by Michael Bloomberg³³, the Task Force's final report published in June 2017 specifies the elements of climate reporting expected in company reports in four core areas: governance, strategy, risk management, and metrics and targets.

There is no doubt that the recommendations and the framework proposed by the TCFD are a step forward in "climate" reporting, yet they are primarily intended for "non-financial" companies, and especially companies in the most "exposed"³⁴ sectors.

At this stage we would like to point out an anomaly in the TCFD's recommendations on "climate" information disclosure:

- Issuers of equities or bonds are recommended to disclose detailed, comprehensive and relevant information about their governance, strategy, objectives and risk and opportunities management.
- Institutional investors, on the other hand, are in some places in the TCFD's report expected to use information about companies whose equities or bonds they hold in their portfolio, even though the information is non-specific, superficial and regarded as unsuitable by many experts (see below).

In other words, it is no surprise that the global financial industry and the financial markets cannot swing into action unless non-financial companies disclose usable information.

Meanwhile the TCFD's recommendations are based on a conception of the financial markets where intermediaries do not play a relatively significant role. Although some specific recommendations are directed towards banks, they do seem to be quite limited compared to those directed at asset managers and institutional investors.

Turning to methodological aspects, it should be noted that:

- The general portfolio analysis metrics suggested for financial companies³⁵ encourage a static, incomplete and simplistic vision of climate risk management. Quite apart from the fact that these metrics are unable to characterise a company's "climate" strategy, it is unfortunate that disclosure is only recommended for scope 1 and scope 2 emissions.
- The TCFD uses a sectoral approach and identifies five main groups considered to be directly exposed to climate risk: finance; energy; transportation; materials and buildings; and agriculture, food, and forest products.

²² Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups Text with EEA relevance <http://eur-lex.europa.eu/legal-content/FR/TXT/?uri=CELEX%3A32014L0095>

²³ Also see the methodology guide published by Medef "CSR reporting and extra-financial performance declaration, the new legal arrangements" in September 2017

²⁴ Whether or not companies are affected by these arrangements depends on several factors (listed or unlisted companies, average workforce, turnover and balance sheet) specified in Decree no. 2017-1265 transposing Directive 2014/95/EU. In detail:

- Listed companies are affected if their average workforce exceeds 500 employees, their net turnover is above EUR 40 million, or their total balance sheet is more than EUR 20 million.

- Unlisted companies are affected if their average workforce exceeds 500 employees and their net turnover or their total balance sheet is more than EUR 100 million.

²⁵ In practice in the extra-financial performance declaration added to the management report (Order no. 2017-1180 of 19 July 2017)

²⁶ Article R225-105 of the Commercial Code. The Grenelle II (2010) law used to require affected companies to disclose information about the "social and environmental consequences of their business and their societal commitments to promote sustainable development" (article 225 of the Commercial Code) in their management report.

²⁷ Article R225-105 of the Commercial Code

²⁸ Part III of article L225-102-1 of the Commercial Code

²⁹ Article R225-105 of the Commercial Code

³⁰ Article R225-105 of the Commercial Code

³¹ Companies with an average workforce exceeding 500 employees and a net turnover of more than EUR 100 million. Part II of article R.225-105-2 of the Commercial Code

³² See the report of "Observatory 173 on Climate & Life Insurance", Michel Lepetit. <http://www.theshiftproject.org/fr/cet-article/information-sur-les-risques-lies-aux-climats-lassurance-vie-peut-mieux-faire-selon-the-s>

³³ Also chairman of the SASB Foundation Board and CDP sponsor via Bloomberg Philanthropies

³⁴ Finance; energy; transportation; materials and buildings; and agriculture, food, and forest products.

³⁵ In the annex to the TCFD's final report (page 43), asset owners and asset managers are recommended to disclose four indicators in their management report (weighted average carbon intensity, total carbon emissions, carbon footprint, carbon intensity).

- Finally, the TCFD strongly recommends disclosure of information about the use of scenarios in climate risk analysis, which is a major innovation but represents a methodological challenge³⁶.

The TCFD will continue its work into 2018 to ensure that its report is followed up, but its mandate has not been extended. For all these reasons, it is clear that many of the subjects raised call for international collaboration (or European at least, beyond the term of the High Level Expert Group on sustainable finance (HLEG), particularly around methodological issues covered in this report (scenarios, taxonomy, etc.).

According to the TCFD, overall the recommendations have been well-received globally by financial and non-financial stakeholders³⁷. When it comes to applying the recommendations, the only concerns relate to certain competitive or legal issues, and to the release of strategic information via scenario analyses.

In conclusion, we note that French companies are in line with the TCFD's recommendations thanks to the statutory arrangements already in place, with the exception of the recommendation about scenarios which we will return to later.

1.2.2.3 Approach of the European Commission and the HLEG

The High Level Expert Group on Sustainable Finance (HLEG), chaired by Christian Thimann, was established by the European Commission in October 2016. It is composed of 20 senior experts from the civil society, the finance sector and academia and it aims to develop a comprehensive EU strategy on "sustainable finance".

An interim report was released in July 2017. Among the many issues raised by this working group, there was just one general item about the credit rating agencies³⁸ (apart from the attempt to define green finance).

The final recommendations have been published in January 2018. Strictly speaking, The European Commission will set up a working group in order to incorporate

most recommendations from the HLEG into European financial sector regulation.

1.2.3 The financial world is increasingly mobilised

The market, according to the TCFD, is increasingly aware of the issues and places particular value on the disclosure of high-quality *carbon data* and *climate information*. The TCFD's report betrays the complexity of climate risks as a subject, partly because of what the report fails to address.

In the context of the work of the TCFD and the HLEG, and with the appearance of regulations such as article 173, the financial world is not immune from the acceleration described above.

Not so long ago, everyone accepted that the financial sector's carbon footprint did not go beyond its own scope 1 emissions (see Glossary p.53.). This has now changed, and financial institutions increasingly find themselves having to account for their investments, in other words the climate risks to which the assets they finance are exposed.

As we will discuss later, this mobilisation is prompted by a mismatch between the climate risk *materiality* horizon and the horizon used by financial stakeholders in their analysis. This is what Mark Carney referred to as the "tragedy of horizons" in his Lloyd's speech in September 2015³⁹. Bearing in mind the relatively short maturity of asset financing set against the timescale of climate change, financial stakeholders tend not to look past their risk analysis.

This mobilisation goes beyond the existing initiatives from the financial sector such as socially responsible investing or green bonds (mostly climate bonds).



1.2.4 The special case of France

In addition to its electricity production mix, which is already among the most decarbonised in the world, and the proactive climate legislation it has enacted, France also has other attributes allowing it to face the climate change challenge:

- France has built a strong planning culture over the centuries (the country looks well-equipped to deal with the “tragedy of horizons”) and a related culture of major public projects (60s modernisation, nuclear programme of the 70s, 80s and 90s).
- France is one of the few countries with large industrial groups active in all major sectors throughout the world.
- The French higher education system does have its faults but it has produced high-quality engineers, scientists and administrators who are able to profoundly influence the industrial landscape and are ideally placed to implement the complex long-term projects resulting from the energy transition.
- There is broad political consensus on the issue, guaranteeing a long-term political vision.

For these reasons, we believe that the currently enacted French legislation (article 173 and the transposition of Directive 2014/95/EU) can be seen as an opportunity for French companies.

1.2.5 A strategic issue for major companies

It is clear from the above that running a viable business in a “2°C” or “low carbon” world is a real challenge for companies, which must simultaneously develop strategies to adapt to climate change and to mitigate their climate impact. As such, the TCFD calls on all companies to examine their climate strategy. *The Shift Project* was

created in order to mobilise companies to engage not just with the risks but mainly with the long-term opportunities linked with climate change – in a French tradition of bounded optimisation in which it is essential to clearly prioritise the potential effectiveness of the various ways the issue can be addressed.

The TCFD’s final report contains quite a long list of climate risks and opportunities for companies and discusses what impacts they could have.

The energy transition is an opportunity for many companies, with new prospects for their existing products and completely new markets. And there are more, as spelled out in the survey conducted by Caisse des Dépôts in 2015⁴⁰.

³⁶ As indicated by AFEP in its submission to the TCFD: “Non-financial companies as well as banks are very doubtful that the recommendations on climate scenarios are feasible given the high uncertainty of hypotheses and risks of misinterpretation by potential users in case of heterogeneous approaches between competitors of the same sectors.”

³⁷ More than 100 major companies supported the TCFD’s recommendations when they were published at the end of June 2017.

³⁸ “Policy direction: Foster the integration of sustainability and long-term perspectives into ratings. At the very least, leverage the disclosure push that will follow the issuance of the TCFD guidelines by requiring all credit rating agencies to disclose how they consider TCFD-related information in their credit ratings – and updating ESMA guidelines to help them make the best of the newly available data. A comparative mapping to what extent ESG factors are included in rating methodologies would be useful.” High-Level Expert Group on Sustainable Finance interim report (July 2017). IV.5 Credit rating agencies (p 38-39)

³⁹ <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>

⁴⁰ See “Climate policy of the Caisse des Dépôts Group”, Caisse des Dépôts (2015)

EXAMPLES OF CLIMATE-RELATED RISKS AND POTENTIAL FINANCIAL IMPACTS

Type	Climate-Related Risks*	Potential Financial Impacts
Transition Risks	Policy and legal	
	<ul style="list-style-type: none"> Increased pricing of GHG emissions Enhanced emissions-reporting obligations Mandate on and regulation of existing products and services Exposure to litigation 	<ul style="list-style-type: none"> Increased operating costs (e.g., higher compliance costs, increased insurance premiums) Write-offs, asset impairment, and early retirement of existing assets due to policy changes Increased cost and/or reduced demand for products and services resulting from fines and judgments
	Technology	
	<ul style="list-style-type: none"> Substitution of existing products and services with lower emissions options Unsuccessful investment in new technologies Costs to transition to lower emissions technology 	<ul style="list-style-type: none"> Write-offs and early retirement of existing assets Reduced demand for products and services Research and development (R&D) expenditures in new and alternative technologies Capital investments in technology development Costs to adopt/deploy new practices and processes
	Market	
<ul style="list-style-type: none"> Changing customer behavior Uncertainty in market signals Increased cost of raw materials 	<ul style="list-style-type: none"> Reduced demand for goods and services due to shift in consumer preferences Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment) Abrupt and unexpected shifts in energy costs Change in revenue mix and sources, resulting in decreased revenues Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations) 	
Physical Risks	Reputation	
	<ul style="list-style-type: none"> Shifts in consumer preferences Stigmatization of sector Increased stakeholder concern or negative stakeholder feedback 	<ul style="list-style-type: none"> Reduced revenue from decreased demand for goods/services Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions) Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) Reduction in capital availability
	Acute	
	<ul style="list-style-type: none"> Increased severity of extreme weather events such as cyclones and floods 	<ul style="list-style-type: none"> Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)
	Chronic	
<ul style="list-style-type: none"> Changes in precipitation patterns and extreme variability in weather patterns Rising mean temperatures Rising sea levels 	<ul style="list-style-type: none"> Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism) Write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) Increased capital costs (e.g., damage to facilities) Reduced revenues from lower sales/output Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations 	

* The sub-category risks described under each major category are not mutually exclusive, and some overlap exists.



EXAMPLES OF CLIMATE-RELATED RISKS AND POTENTIAL FINANCIAL IMPACTS

Type	Climate-Related Opportunities**	Potential Financial Impacts
Resource Efficiency	<ul style="list-style-type: none"> • Use of more efficient modes of transport • Use of more efficient production and distribution processes • Use of recycling • Move to more efficient buildings • Reduced water usage and consumption 	<ul style="list-style-type: none"> • Reduced operating costs (e.g., through efficiency gains and cost reduction) • Increased production capacity, resulting in increased revenues • Increased value of fixed assets (e.g., highly reted energy-efficient buildings) • Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy Source	<ul style="list-style-type: none"> • Use of lower-emission sources of energy • Use of supportive policy incentives • Use of new technologies • Participation in carbon market • Shift toward decentralized energy generation 	<ul style="list-style-type: none"> • Reduced operational costs (e.g., through use of lowest cost abatement) • Reduced exposure to future fossil fuel price increases • Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon • Returns on investment in low-emission technology • Increased capital availability (e.g., as more investors favor lower-emissions producers) • Reputational benefits resulting in increased demand for goods/services
Products and Services	<ul style="list-style-type: none"> • Development and/or expansion of low emission goods and services • Development of climate adaptation and insurance risk solutions • Development of new products or services through R&D and innovation • Ability to diversify business activities • Shift in consumer preferences 	<ul style="list-style-type: none"> • Increased revenue through demand for lower emissions products and services • Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) • Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
Markets	<ul style="list-style-type: none"> • Access to new markets • Use of public-sector incentives • Access to new assets and locations needing insurance coverage 	<ul style="list-style-type: none"> • Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) • Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	<ul style="list-style-type: none"> • Participation in renewable energy programs and adoption of energy-efficiency measures • Resource substitutes/diversification 	<ul style="list-style-type: none"> • Increased market valuation through resilience planning (e.g., infrastructure, land, buildings) • Increased reliability of supply chain and ability to operate under various conditions • Increased revenue through new products and services related to ensuring resiliency

** The opportunity categories are not mutually exclusive, and some overlap exists.

Chapter 2

Ecosystem of climate risk analysis

To take stock of climate risk analysis, we felt it was important to gather information from the leading players directly or indirectly involved in conducting this kind of analysis. We decided to approach the following players:

- **Extra-financial rating agencies:** at present, these agencies are inherently more likely to focus on climate risk analysis, albeit within a broader ESG context. We decided to meet with agencies⁴¹ which, through their activities, are particularly influential in the French and European market, namely *Vigeo-Eiris*, *Oekom Research*, *MSCI ESG Research* and *RobecoSAM*⁴².
- **Credit rating agencies:** these organisations have been showing more interest in “climate” as a topic since the Paris Agreement, and – thanks to their market influence, the means at their disposal and their risk management expertise – they could play a decisive role in the future development of analysis methodologies. We met with *S&P Global Ratings* and *Moody’s*, which alone account for almost 80% of the European rating market⁴³.
- **Carbon data providers:** considering the importance of carbon data in climate risk analysis, the quality of the data is critical. In this category, we met with *CDP* (formerly the *Carbon Disclosure Project*), which has a virtual monopoly as a raw carbon data provider. A small number of organisations produce carbon data with value added (in other words processed data) – we met with *Trucost*, *ISS Ethix Climate Solution* and *Carbon 4 finance*.
- **Index providers:** we thought it would be interesting to talk to index providers, bearing in mind the proliferation of low-carbon indices and the growth in passive or quasi-passive asset management. We met with *MCSI* and *S&P DowJones Indices*.

- **Auditors:** auditors do not actively participate in the rating process but are responsible for “verifying” compliance of data and information concerning “carbon”. These organisations have also been involved in the work of the TCFD. We therefore decided it would be useful to meet with the French representative body of the audit profession (*Compagnie nationale des commissaires aux comptes* (CNCC)) and two of the Big Four⁴⁴.
- **The public authorities:** public authorities define or help define the regulatory framework in which companies develop. In this category, we thought it would be useful to meet with the *French Treasury* (concerning the implementing decree of article 173 of the French Energy Transition for Green Growth Act/LTECV), *AMF* (financial markets regulator), *Caisse des Dépôts* (major long-term public investor in the French market), and *ADEME* (the French Environment and Energy Management Agency, involved in standardising the way emissions are calculated and in a number of initiatives linked to climate change scenarios).
- **The banks:** by their nature, banks are specialists in risk analysis and are the dominant financial intermediaries in European markets. We thought it would be useful to meet with *Crédit Agricole SA* and *Société Générale* to find out more about how they handle climate risks and especially how they grant credit to companies.

⁴¹ We also contacted the *Sustainalytics* agency, which unfortunately declined to take part in this study.

⁴² *RobecoSAM* is a special case because it is not strictly an agency but a subsidiary of the *Robeco Group*, providing the management company with research-based input into its investment strategy. The reason we included it in the group, however, is the link between *RobecoSAM* and the *DJSI* index.

⁴³ *Fitch Ratings* has been silent on the topic of “climate” risk so we felt it would not be useful to meet representatives.

⁴⁴ *E&Y* and *PWC*. There are methodological similarities across the *Big Four*.

2.1 Extra-financial rating agencies

The “extra-financial” rating agencies primarily offer services to rate issuers of financial securities along extra-financial – or non-financial – lines. The rating is intended as a way of assessing and comparing the ESG policies implemented by the issuers.

These agencies grew in response to an emerging demand among investors wishing to adjust their investments according to environmental, social and governance (ESG) criteria. In particular, their services are used by management companies in order to establish SRI (Socially Responsible Investment) funds.

Historically, the rating methodologies developed by extra-financial rating agencies have been extremely varied. They remain heavily influenced by the approach used in ESG analysis (mainly qualitative) and the results they provide are necessarily very different from one agency to another.

Significantly, this is the context in which the discipline of climate risk assessment first emerged in the 2000s.

As stressed by Novethic in its *“Panorama of extra-financial rating agencies⁴⁵”*, the extra-financial rating market is in a transition period. Certain trends can be picked out which influence the way the market is developing:

- **Concentration of providers:** the European extra-financial rating market is currently dominated by a few agencies. This process still has some way to go and is explained by the immaturity of the market and by the fragile business model which is highly sensitive to market fluctuations.
- **Emergence of “climate” as a topic:** concerns around climate change have taken their place alongside other environmental issues, explaining why most extra-financial rating agencies have developed a “climate” assessment service as part of their offering.

- **The growing interest of financial data providers in ESG data including climate-related data:** alongside financial information, these organisations aim to give their clients access to the issuers' ESG data (for example the partnership between *Bloomberg* and *Sustainalytics* in 2014, and *Thomson Reuters'* acquisition of *Asset4*). This trend appears to be linked to the growing importance these major players attach to owning or controlling databases whose strategic significance may unfold in the future.
- **Sector specialisation:** specialist organisations have emerged in certain sectors (for example Global Real Estate Sustainability Benchmark, GRESB, for commercial property and infrastructure). This trend towards specialisation appears to arise from sector-specific considerations, particularly in the most directly exposed sectors (see the five sectors of the TCFD).

These offerings are developed in response to investor demand, and extra-financial rating agencies are funded by investors.

Unlike credit rating agencies, extra-financial rating agencies' practices and analysis methodologies are not currently subject to oversight by a regulatory body (see 3.2.4 Regulation of financial and extra-financial rating agencies, p.44).

2.1.1 Fragile business model

Bearing in mind the complexity of the subject as touched upon in the first part of this document, substantial expertise and resources are necessary to analyse companies' “low carbon” strategy, the business sectors, and the climate risks and opportunities they are exposed to within their sector, or even just to assess their carbon footprint.

This is especially true because agencies deal with clients whose investment portfolio is, by definition, quite large. The investment portfolio covered by the agencies



frequently exceeds the 2,500 companies in the MSCI ACWI⁴⁶.

Extra-financial rating agencies earn most of their income from services sold to investors, primarily issuer (debt, equity) ratings, portfolio analysis, database access, shareholder engagement consultancy services. From our discussions with the agencies, the amounts investors are willing to pay appear to be modest in view of the work that is necessary and the challenges to be overcome.

As a result, the resources set up by the agencies sometimes seem insufficient and falling short of the announced ambitions and the complexity of the issue.

Alongside their rating activity, some agencies may develop service activities which are related but different in character and targeted at the companies⁴⁷. This potentially raises questions around conflicts of interest. This sensitive issue also affects the credit rating agencies.

Finally, we found that the rating methodologies were very rarely publicly available in their entirety, presumably for reasons of confidentiality combined with the strategic nature of this intangible asset for the agencies. On occasion, this confidentiality also extends to the rating process. Here, the public disclosures of stakeholders could be modelled on a less restrictive version of the rules applicable to credit rating agencies.

2.1.2 Climate risk analysis remains subject to ESG standards

None of the agencies we met is inherently focused 100% on climate. The issue of "climate" remains "part" of the "environment" category which is itself part of the broader "ESG" category. Climate risk is therefore just a small fraction of the ESG rating supplied by the agencies.

Most of the methodologies are based on a weighting⁴⁸ of the E, S and G criteria (and sub-criteria) causing the systemic and irreversible nature of the climate risk to be diluted and ultimately underestimated. There may well

be links between the various criteria addressed (for example good governance might encourage proper consideration of "climate" as an issue), but it is virtually inconceivable that a good result for the "social" criterion could make up for a poor result for the "climate" criterion, giving the issuer an acceptable overall score. To this day, the methodologies of extra-financial rating agencies remain heavily influenced by the ESG approach (see 1.2.1. Climate risks are unique, p.13.).

Some agencies do offer a standalone "climate" analysis or climate risk assessment service, mainly for portfolio building and analysis, but this is the exception.

2.2 Credit rating agencies

Historically, the role of credit rating agencies is to give an opinion on the default risk of an issue of (private and public) securities during a specified time horizon.

The rating market is dominated by three agencies known as the Big Three – *S&P Global Ratings*, *Moody's Investors Services* (*Moody's* below) and *Fitch Ratings* – which account for almost 93% of the European market⁴⁹ and are all controlled mostly by US capital. 23 other credit rating agencies are registered with the ESMA (European Securities and Markets Authority). They have organised themselves in a federation of small credit rating agencies⁵⁰ but their market share is minimal (7%) and so is their influence.

⁴⁶ See "Panorama des agences de notation extra-financière" [Panorarama of extra-financial rating agencies], October 2014 and "Notation extra-financière et empreinte carbone : acteurs et offres" [Extra-financial rating and carbon footprint: actors and offerings], September 2016

⁴⁶ The MSCI All Country World (ACWI) index contains large-cap and mid-cap stocks in 23 developed markets and 24 emerging markets. The index comprises a total of almost 2,500 companies.

⁴⁷ Primarily advice on "ESG" strategy or solicited rating.

⁴⁸ Arithmetic mean of the scores for each risk (unlike, for example, a geometric mean)

⁴⁹ S&P Global Ratings has a 45% market share, Moody's 31%, and Fitch Ratings 17% (ESMA, 2016)

⁵⁰ The EACRA (European Association of Credit Rating Agencies), created in 2009.

Considering the market concentration and the nature of the risks being assessed, there is a de facto similarity in the “company” risk analysis methodologies used by the rating agencies. They also have a convergent approach to individual risks.

These methodologies take account of financial factors (financial ratios) and also non-financial factors (such as the company’s business profile, sector analyses) where such criteria are deemed to be “significant and relevant” (i.e. affecting the issuer’s ability to repay its debt on time). In particular, these non-financial criteria include “ESG” criteria.

As such, the rating agencies have identified the possible *materiality* of climate risk for credit quality. Credit rating agencies have kept quiet about this until recently but started showing more interest around the time of COP 21, partly due to the pressure applied by certain investors⁵¹. Since then, *S&P Global Ratings* and *Moody’s* have published papers, contributions, reports, etc. These two agencies have also stepped up their work on climate risk analysis by participating in the TCFD.

The business model of credit rating agencies is highly profitable and is based on the issuer-payer principle. Indeed, ten years after the subprime crisis that shook global finance, the Big Three are broadly speaking in the best of financial health⁵² thanks to a lack of effective competition and despite the sanctions imposed by the US authorities for their excesses which stoked the crisis⁵³. The financial agencies have considerable resources for research in general which could be allocated to climate risk.

In conclusion, credit rating agencies have been subject to tightly structured regulation since the subprime crisis mentioned above, especially in Europe (see 3.2.4. Regulation of financial and extra-financial rating agencies, p.44).

2.2.1 How is climate risk factored into credit rating methodologies?

In most of the papers published by *S&P Global Ratings* and *Moody’s*, climate risk is included in the “environment” category and continues to be analysed as such⁵⁴.

From the beginning the agencies have taken a sector-based approach to address climate risk which has turned out to be highly effective (see the TCFD). Their efforts are initially focused on sectors with high *materiality*⁵⁴ (energy, transport, industry).

It appears that climate risk is essentially considered along “regulatory” lines. For both agencies, the biggest threat to an issuer’s ability to repay its debt is the rollout of environmental regulations limiting atmospheric greenhouse gas emissions (higher production costs or reduced demand for a product for example).

The physical impact of climate change (extreme weather events, rising sea levels) is the other way of looking at climate risks (the direct impact or the impact on the supply chain for example). However, these two agencies state that the probability and severity of such events remain uncertain and difficult to predict, limiting their effect on credit analysis.

Indeed, these two ways of approaching climate risks affect what we might call the “business profile”.

2.2.2 What effect do “climate” factors have on the credit rating?

Moody’s and *S&P Global Ratings* both recognise that “climate” factors, despite being taken into account, hardly affect issuers’ credit ratings and do not count among the main drivers.

S&P Global Ratings has also stated that “to date, a relatively small proportion of overall corporate rating actions have resulted directly from Environmental &



Climate risks (...) their number is increasing". And according to Moody's, "direct climate change hazards are not at present a material driver for ratings".

In our view this can be explained by the current mismatch between the credit risk analysis horizon (between two and five years⁵⁷) and the systemic climate risk occurrence horizon – a clear illustration of Mark Carney's "tragedy of horizons".

In their various publications, both agencies stress that an issuer's financial performance becomes dramatically less predictable beyond a few years, and that it is tricky to assess how the performance will be affected by a long-term risk which itself has an uncertain probability and intensity.

Note: In project finance, focusing on the specific characteristics of the underlying projects and the duration of the financing arrangements encourages rating agencies to take account of the climate risk in a more explicit way.

Against this background, S&P *Global Ratings* and *Moody's* welcome the TCFD's recommendations and expect that issuers' *climate information and carbon data* disclosure within a standardised framework will allow them to better understand and assess the climate risk. That said, both agencies note that certain challenges remain, for example around the consistency of declarations (the recommendations are voluntary) or the disclosure of information about the use of scenarios⁵⁸.

Both agencies have however stated that data disclosure as recommended by the TCFD will have no impact on the credit rating unless the information is deemed to be "significant and relevant". And *S&P Global Ratings* concludes "(...) at this stage, we do not expect much ratings impact (...)".

2.2.3 Bounded supply and demand

While emphasizing that their methodologies evolve and adapt, *S&P Global Ratings* and *Moody's* do consider them capable of taking account of the impact of climate

risks on issuers' credit ratings. Thus, according to *S&P Global Ratings*: "As demonstrated by the past two years of rating actions, our corporate ratings methodology, [...] is well equipped to pick up on these risks as they emerge and pose a threat to credit quality."

Some investors appear to be more motivated by other urgent issues with a major impact such as sluggish growth, negative interest rates, or digital transformations. As *S&P Global Ratings*, which knows the financial industry very well, explains: "We recognize that financial service providers have more immediate and bigger concerns vying for their attention. Issues such as regulation, low growth, and the negative interest rates being set in some regions could have significant medium-term effects. That said, we consider that climate change risk is only likely to grow in importance and its potential impact is likely to increase."

The close oversight and the regulatory framework in which these stakeholders operate (ESMA in the EU) might limit innovation in immature methodologies (see 3.2.4. Regulation of financial and extra-financial rating agencies, p.44).

⁵¹ For example PRI's initiative calling on the Big Three to give ESG risks a bigger role in their credit analysis (PRI - Statement on ESG in credit ratings – May 2016). The document was signed by 100 investors with EUR 16,000 billion in assets under management, and six credit rating agencies.

⁵² See *Les Echos* of 23/03/2016: Rating agencies booming despite continuing excesses

⁵³ *S&P Global Ratings* was heavily sanctioned in 2013. *Moody's* was fined almost 860 million dollars in 2017.

⁵⁴ *S&P Global Ratings* uses the term "Environmental and climate risks" and *Moody's* "Environmental risks". See "How environmental and climate risks factor into global corporate ratings" (*S&P Global Ratings*, 2015) and "Moody's approach to assessing the credit impacts of environmental risks" (*Moody's*, 2015)

⁵⁵ "Climate" risk is therefore analysed on the same basis as any other "environmental" risks, essentially along "regulatory" lines

⁵⁶ For example see the "Heat map" created by *Moody's* and "How environmental and climate risks factor into global corporate ratings" (*S&P Global Ratings*, 2015)

⁵⁷ "A foreseeable horizon is generally less than two years for a speculative grade credit (rated "BB+" and below) and no more than five years for an investment grade credit ("BBB-" and above)" (*S&P Global Ratings*, 2015)

⁵⁸ *Moody's* explains that "implementation of the TCFD recommendations will likely be gradual and subject to challenge. For example, concerns over the increased oversight and costs associated with publishing climate disclosure in audited financial filings, or lack of consensus over which scenario framework to apply" ("FSB TCFD Recommendations will lead to a mainstreaming of climate disclosure over time", *Moody's*, 2017)

The use of *scenarios* is one of the methodological innovations strongly recommended by the TCFD for future use. On this subject, the agencies have announced that for now, they will not incorporate issuers' scenarios in their credit analyses, and indeed no methodology has yet been implemented in order to do so. Despite the considerable means and the teams of economists at their disposal, they currently have no plan to produce their own *scenarios*.

Instead, these agencies are positioning themselves more intently in the "green bonds" market (mainly "climate bonds"), where investor demand is higher and where they have developed more climate-specific analysis methodologies⁵⁹.

2.3 Carbon data providers and calculators

2.3.1 What is a carbon data provider?

The term "data provider" can cause confusion, and because different types of organisation "produce" data of very different kinds, it is useful to provide a clear definition. In the following we define "data providers" as organisations:

- Which have developed their own calculation methodology for issuers' carbon data, thereby adding value to the raw and/or unverified data.
- Whose business model is based on the sale of this carbon data to investors or other financial organisations.
- For which any rating service offered to investors or other financial organisations (including strategy analysis, risk management analysis, etc.) does not make up a significant proportion of revenues.

This definition therefore excludes extra-financial rating agencies (some of which process data but this is not their core activity) and CDP (which collects data submitted by the companies and makes it available, but without further processing or any assessment of relevance). Although CDP is not a data provider according to our definition, it is a special case and will be presented and studied in this section because it comes close to the definition in many respects.

Data providers appeared when the issue of climate started to take on a new importance from the end of the 2000s. Their products are a response to a growing demand among investors for an estimation of the carbon footprint of their portfolio, for example in connection with new regulations like article 173-VI in France, which requires investors to provide information about the climate risks they are exposed to.

The data provider landscape has changed in recent years. *Trucost*, an established organisation, was acquired by *S&P DowJones Indices*⁶⁰. *CNI (Carbon Neutral Investment, subsidiary of the South Pole Group)* was acquired by *ISS (Institutional Shareholder Services)* to become *ISS Ethix Climate Solutions*.

2.3.2 Modelling carbon data

Carbon data is a key element in climate risk analysis – it can be used to determine an issuer's carbon footprint and other potentially relevant findings (avoided emissions, changes in emissions or certain ratios over time, etc.). The amount of carbon data being disclosed – a key recommendation of the TCFD – is steadily increasing.

The consistency, reliability and availability of the data remain a real challenge for climate risk analysis.

Each of the three carbon data providers we met emphasised the wide disparity (especially between geographical regions) of "primary carbon data" (*i.e.* directly provided by the company or available on CDP's platform) in terms of its availability and comprehensiveness. They also told



us that some of the “primary carbon data” may include errors, disparities or aggregations that must be corrected before the data can be used (see 3.1.4 Data verification, p.41).

The main function of data providers is to take “raw” input data⁶¹ and offer ways to correct defects in the reliability, comprehensiveness and availability of the “primary carbon data”.

Moreover, data providers deal mainly with investors. Their task is to measure the carbon footprint of investment portfolios, where the issue of double counting of indirect emissions⁶² is still a real methodological challenge.

To tackle the challenge, each data provider uses a “proprietary” methodology to estimate *carbon data*. These methodologies are complex and a serious analysis of their quality would deserve a study of its own. It is therefore difficult for us to decide on the merits of any particular data provider. Without getting ahead of ourselves, though, these methodologies could in our view be differentiated by the following:

- 1/ **The methodological approach:** there are several approaches (described in 3.1.3. Carbon data modelling methodologies, p.40) which are quite different in their principle, specifically in terms of the nature of the “raw input data used”.
- 2/ **The sources of emissions covered when measuring the carbon footprint of a portfolio:** some methodologies only produce a partial carbon footprint, including scope 1 and scope 2 but just some of scope 3 (see Glossary p.53).

More generally, the expertise built up and the quality of the constituent elements of the models (historical databases, emission factors, sector ratios, etc.) are all good ways to characterise the quality and the reliability of the *carbon data* produced.

The coherence over time of annual data series is, in our view, a challenge. Issues of (1) *carbon data* archiving,

(2) the methodologies used to produce it, and (3) the traceability of the results obtained could be modelled on a less restrictive version of the rules applicable to credit rating agencies.

2.3.3 CDP (formerly the Carbon Disclosure Project)

Established in the early 2000s, CDP is a British NGO whose initial goal is to encourage companies and public organisations to be more transparent about the climate issue. To do this, CDP created and now operates one of the biggest disclosure platforms for *carbon data* and information, drawing in particular upon voluntary declarations from companies which respond to the CDP “climate change” questionnaire.

Of the companies approached in 2016, almost 5,600 responded the questionnaire.

In just a few years, CDP has created a virtual monopoly in the centralisation and disclosure of *carbon data* and information.

This situation raises many concerns and sometimes causes confusion (mainly relating to the consulting services also offered to companies) around the role of the organisation and the nature of the information and data provided.

⁵⁹ S&P Global Ratings, see Proposal For A Green Bond Evaluation Tool and for Moody's, see Green Bond Assessment Methodology

⁶⁰ S&P Global Ratings told us that at present, “carbon” data and the Trucost methodology were not used in credit rating. Instead, “carbon” data from Trucost is used to create “low carbon” or “effective carbon” indices developed by S&P Dow Jones Indices.

⁶¹ “Raw input data” means data which has not been processed by the data provider. The data could be of different kinds: “carbon” data declared by the issuer, activity-linked physical data (quantities or volumes produced, etc.), financial data (total sales for a product or activity, etc.).

⁶² The greenhouse gas emissions in a company's total “carbon” footprint are direct and indirect (for example from suppliers or sold products). The indirect emissions of one company and therefore often the direct emissions of other companies. When the total “carbon” footprint of a portfolio is measured, simply adding up the “carbon” footprints of the companies in the portfolio means the same greenhouse gas emissions will be counted more than once.

At the time of writing, we can report that CDP carbon data is, in one way or another and to varying degrees, used as a starting point by most of the organisations involved in climate risk assessment. As such, and leaving quality out of the equation (see below), the data declaration process is undeniably more productive now that the data is centralised to an extent by CDP.

We feel it is important to stress the following points:

- 1/ **Quality of the data:** CDP itself defines its primary function as creating “inventories” of the carbon data and *climate information* declared by the contributing companies. To date, this data and information is accepted as is, without any further verification nor comparability from one company to another.
- 2/ **Regulation:** as of 2018, the activities of CDP are unregulated, notably in France and in Europe, despite its major role in the process of supplying *carbon data* and *climate information*.
- 3/ **Governance:** CDP’s governance is heavily influenced by the investors supporting – notably financially – the procedures and activities of CDP. According to CDP, 2,000 of the 5,600 responses to the climate change questionnaire are the result of requests from investors. Non-financial companies are not represented on CDP’s board of trustees.
- 4/ **The “CDP score”:** as a way of persuading issuers to disclose their *carbon data* and *climate information*, CDP created a kind of score (the “CDP score”) which was initially supposed to assess the formal quality of the responses. The scoring approach has moved on, and now apparently claims to include a “performance” dimension for the issuer (Disclosure, Awareness, Management, Leadership) without being a real climate risk analysis. This situation may cause users of the score to confuse “formalisation of information” with “risk management”.
- 5/ **CDP and the TCFD:** CDP claims to be very close to the TCFD and reports that CDP made a major contribution to the final recommendations⁶³. It should be

noted that from 2018, the CDP questionnaire will implement all the recommendations applicable to companies as formulated by the TCFD.

2.4 Index providers

Index-based asset management is becoming mainstream in the financial market. The demand for this management method is growing mainly because asset management companies find it so difficult to outperform benchmark indices (by sector, asset class, etc.) with so-called “active” asset management, and because of the low and declining cost of index-based management. 100% passive index-based management (ETFs⁶⁴ and trackers) is spreading at a dizzying speed across all international markets, and has crossed the threshold of USD 4,000 billion under management. This subject warrants a specific analysis, considering the growing importance of passive management, the changing nature of its environment, and its interaction with the climate issue.

In fact, this trend has an impact on the issue of “climate”. The main stock market index providers are now offering “*low carbon*” or “*effective carbon*” indices with securities selected according to their carbon data. The growth of the carbon indexation market may receive an additional boost now that the European regulator (ESMA) has officially recognised ESG. The acquisition of *Trucost* (the largest carbon data provider by turnover, see 2.3. Data providers, p.30) by *S&P DowJones* Indices further illustrates the way things are moving.

There are many different methodologies and criteria for inclusion of securities in the index, depending on the goals of the asset manager. In particular, there are two approaches:



1/ **The best-in-class approach**, which involves favouring the companies that perform best, according to one or more criteria within their business sector (through overweighting or exclusion), without fundamentally altering the sector allocation of securities in the index so that it preserves a tracking error⁶⁵ close to the benchmarks. This approach is in widespread use in “ESG” and “low carbon” indices⁶⁶.

2/ **The exclusionary approach**, which involves selecting the best-performing companies irrespective of their business sector – this effectively removes the sectors considered to be at risk (the extractive industries for example) and favours those with solutions considered to be “low carbon”.

The strong growth of index-based management, especially passive management, as well as the nature of the methodologies used to create the indices, mean that company leaders place great importance on participation in classic financial indices and also “ESG” and “climate” indices. As such, the mobilising effect is strong.

That said, **low carbon indices primarily serve a niche market**. The volume of assets benchmarked with “low carbon” (or even ESG) indices remains limited at present. According to MSCI, the volume of assets under management benchmarked to its “ESG” indices is almost USD 62 billion (in June 2017) throughout the world⁶⁷, although this number is rising. To that extent, the index providers are apparently having a hard time influencing their investor clients.

Furthermore, the criteria for inclusion in most “low carbon” or “effective carbon” indices only have a partial and static vision of climate risk.

The criteria generally used in “low carbon” index-based management to put together securities in the index based on companies’ partial carbon footprint, limited to scope 1 and 2 emissions. This approach inevitably conceals emissions from the whole supply chain in which the company is embedded, making the indices biased and non-prospective (see 1.2.2.2 Task Force on

Climate-related Financial Disclosures (TCFD), p.18). Meanwhile the tight surveillance and the regulatory framework in which the index providers operate hold back innovation in the indicators and methodologies under development.

For these two reasons the volume (albeit growing) of assets benchmarked to “low carbon” (or “ESG”) indices comes nowhere near the importance managers sometimes claim to place on involvement in these indices.

⁶³ “The work of the Financial Stability Board’s Task Force on Climate-related Financial Disclosures (TCFD) builds on 17 years of work by CDP to root climate disclosure as a tool for enhanced global financial stability.” (CDP, 2017)

⁶⁴ ETFs (Exchange-Traded Funds) are baskets of securities selected with the aim of replicating as closely as possible movements in the indices to which they are benchmarked. They are traded on a stock exchange like individual securities and unlike classic index-based funds, they can be bought and sold in real time 24 hours a day.

⁶⁵ The tracking error or replication error is a measure of risk used for asset management in index-based portfolios or as compared to a benchmark index. It is the standard deviation of the difference in the portfolio and benchmark returns.

⁶⁶ “Reconciling responsible investment and index management [Réconcilier investissement responsable et gestion indiciaire]”, Novethic (2014)

⁶⁷ Compare this amount with the total assets under management benchmarked to MSCI indices, which are almost USD 11,000 billion.

2.5 Auditors

Extending legal reporting requirements of companies to *climate information* and *carbon data* (for example including an extra-financial performance statement in the management report) gives auditors a very important role in the climate risk analysis ecosystem.

The audit market is dominated by four organisations known as the Big Four (*E&Y, PWC, Deloitte* and *KPMG*). Auditing is not their only activity⁶⁸ and each has developed a major consulting business that accounts for much of their revenues.

Through this consulting business, auditors have been mobilised on ESG issues in general, and climate change in particular, for several years. They devote considerable resources and manpower (especially in France with teams of 50-100) to these issues and their core business and their size give them a detailed knowledge of all sectors.

Beyond that, auditors understand the verification issues when their clients disclose climate risk information, and they know they are exposed to the risk associated with the *materiality of carbon data and climate information*⁶⁹. In our view, the Big Four's participation in the work of the TCFD sends an important signal.

In their audit of the extra-financial performance statement which now forms part of the management report, auditors are supposed to provide a reasoned opinion as to the conformity and the truth and fairness of the information contained in it. This is not the same thing as a certification in the accounting sense.

Auditors claims to have developed climate risk analysis methodologies exclusively to monitor the consistency of the audited data. However, they are not made public.

In this sense it appears that auditors bring reliability to the process of obtaining *carbon data* and *climate infor-*

mation. In particular, this reliability helps to ensure that the *carbon data* collection processes are in accordance with legislation and internal calculation protocols.

2.6 French public and quasi-public organisations

As things stand in France, the regulatory burden on companies is light with regard to "climate". The legal provisions use the "comply or explain" concept and organisations are given considerable leeway (see 1.2.2.1 French regulations, p.17 and 1.2.2.3 Approach of the European Commission and the HLEG, p.20).

In general terms, the French administration and quasi-public organisations (like *the Caisse des Dépôts*) are beginning to address the issue⁷⁰. Nevertheless we found the following:

- 1/ A lack of coordination in the activities of government agencies in an area which is admittedly changing fast.** What appears to be missing is an institution to unite and coordinate the ambitions and expertise of the French administration and its offices in France and abroad.
- 2/ To varying degrees, a real shortage of funds within each organisation to address climate change issue and its systemic dimension** (see 1.2.2 Systemic risks within a well-defined time frame, p.17).

2.6.1 French Treasury

The department responsible for "climate" in the French Treasury was especially proactive in implementing article 173 of the LTECV for companies, investors and banks.



Beyond the aspects mentioned in the above section entitled “French regulations” (p.17), we note that the approach of the French Treasury claims to be mindful of the quality of international (especially European) cooperation and appears to be in line with many of the TCFD’s recommendations. Transposition of the European directive (2014/95/EU) was not completed until the TCFD published its final report.

The French Treasury’s department responsible for “climate” is also sensitive to the interests of French companies and to Paris as a financial centre in the global debate. It confirms that the current French legislation should allow French companies to take the lead in disclosing information about their “climate” strategy, and to comply with (or even exceed) the main existing or forthcoming international standards.

As stated above, the French Treasury department responsible for “climate” stresses the need for French non-financial companies and professional organisations to be proactive with regard to carbon footprint measuring methodologies and risk analysis.

The department is also a driving force in the use of *scenarios* for banks⁷¹.

2.6.2 French Market Authority (AMF)

The AMF regulates participants and products on financial markets in France. With regard to the climate change issue, it covers companies that issue securities as well as investment companies.

As far as climate risks are concerned, the AMF is not currently mandated to scrutinise the data or methodologies of financial institutions in particular, although it does ensure that advertising and commercial documents comply with the services and products offered

Considering the importance of the issues around climate risk, the resources devoted to it seem to be inadequate, but the issues have at least been clearly identified.

2.6.3 Caisse des Dépôts

The investment strategy of the *Caisse des Dépôts* means that the vision for its own balance sheet and its affiliates is long term/very long term through savings funds. It quickly positioned itself as a major “climate” player by assigning significant personnel, establishing the *I4CE* (Institute for Climate Economics) think tank, and creating ties with the *AFD* (French Development Agency), itself very active in this area.

The *Caisse des Dépôts* develops and publishes a “climate” strategy aimed at reducing the carbon footprint of its portfolio, and contributes to the emerging methodologies. It thereby supports the use of prospective scenarios by the companies in which it invests, in particular the *Science Based Target* initiative.

2.6.4 French General Commission on Sustainable Development (CGDD)

The CGDD brought together and leads two working groups on article 173:

- One group is still running as a forum for companies to exchange ideas about part IV (disclosure of greenhouse gas emissions including “significant items” and emissions linked to the use of sold products).
- The other group concentrates on climate risk analysis methodologies for institutional investors (part VI).

The resources available to this organisation appear to be modest compared to the challenges.

⁶⁸ The issue of conflicts of interest is extremely sensitive for this profession and is covered by a substantial regulatory corpus.

⁶⁹ Auditors are not the only organisations involved in the certification of environmental data. The law (Part II of article R.225-105-2 of the Commercial Code) states that the extra-financial performance declaration must be verified as true and fair by an independent third-party body approved by COFRAC. Usually however, and especially for large companies, these independent third-parties bodies are auditors.

⁷⁰ We met with ADEME to discuss scenarios in particular (REF)

⁷¹ “Assessing climate change-related risks in the banking sector”, DGT (January 2017).

2.7 Financial backers (banks)

The role of banks is not within the remit of this report because the risk analysis is internal and not intended to be made public. Bearing in mind the critical intermediary role played by banks in financing the European economy (70% of financing operations⁷², very unlike the American market which is essentially disintermediated via the bond markets, see the Glossary, p.53) and the steps taken by several banks to develop the methodologies (measuring the carbon footprint of bank portfolios), we felt it would nevertheless be useful to discuss issues around climate risk management as they relate to this category of organisations. Remember that article 173-V is specific to the banking sector.

Banks play a crucial role in allocating capital. As a result of this activity, banking institutions are involved in many different economic sectors and geographical zones. As such, like many other organisations, banks are exposed to climate risk.

In its report on climate risk in the banking sector⁷³, the French Treasury states that from the banks' point of view, climate risk – physical risk and transition risk – feeds through into credit risk, market risk and liquidity risk.

According to the French Treasury, the French banks are currently paying more attention to transition risk than physical risk. Exposure to the sectors identified in the French Treasury report as the most sensitive to these risks is EUR 602 billion (13% of total exposure) and remains concentrated primarily in Europe.

The French Treasury has put forward a framework for the use of scenarios for climate risk analysis in the banking sector.

The two banks we met with expressed their wish to

include “ESG” and climate risk analysis when granting credit to companies of all sizes.

French academic institutions have developed a methodology to assess the carbon footprint of banking portfolios. The main advantage of the methodology is that it tackles the issue of “double-counting” of emissions, which is a particular problem for banks and other financial institutions (see 3.1.3 *Carbon data* modelling methodologies, p.40). This methodology is part of a wider process aimed at characterising the climate risk of counterparties.

Note that the Anglo-American vision (disintermediated market) seems to predominate in the TCFD's⁷⁴ recommendations and may not be appropriate for European markets (relatively intermediated).

⁷² Paradoxically, since the 2008 crisis, we have seen 1/ the relative disintermediation of the European markets, and 2/ shorter terms of loans granted by the European banking system.

⁷³ “Assessing climate change-related risks in the banking sector”, DGT (January 2017).

⁷⁴ Little is said about the kind of information to be disclosed by the banks about credit portfolio analysis, compared to the guidance provided for institutional investors.



Chapter 3

Methodological issues

3.1 Carbon data and climate information

Climate risk analysis methodologies are based on quantifiable data (*carbon data*) and qualitative information (*climate information*).

3.1.1 Sources of carbon data and climate information

The rating organisations use a number of sources as input into their analysis. There are three main channels for data and information:

- **The management report (or other company's reports):** these documents are published by the issuer and are audited by specialist bodies (auditors). As such they are subject to corporate responsibility (document storage and fiduciary responsibility). In France, the new statutory reporting obligations have transformed the management reports into a high-quality source of information which is compatible with the main international standards (e.g. the TCFD) as we have seen.
- **Direct questionnaires:** these questionnaires are sent to issuers as a way of collecting specific information. In some cases they cover information which is already disclosed in the management reports.
- **The CDP "climate change" questionnaire:** the data collected by CDP is used by many different organisations. Again, this data and information are inevitably inconsistent and are not currently verified.
- **Global greenhouse gas emissions data from the UNFCCC** (United Nations Framework Convention on Climate Change)⁷⁵.

Alongside the declared *carbon data*, the rating organisations use modelled *carbon data* in order to even out differences (mainly geographical) in the availability and reliability of the declared data or to verify the data. There are major differences between the methodologies used to estimate the carbon footprint (scope, methodological approach, the nature of the input data, see 3.1.3 *carbon data* modelling methodologies, p.40).

Each rating organisation uses its own stream of carbon data and climate information. In most cases the main source is the *carbon data* and information declared in the management reports. Again, the data and information declared to CDP are used by virtually all organisations for different purposes and to varying degrees.

Note that there do not appear to be any general indicators demonstrating the quality of *carbon data*.

3.1.2 Collecting carbon data and climate information

The questionnaires sent out by the extra-financial rating agencies and CDP are many and varied. This makes it time-consuming and resource-intensive for issuers to reply. As mentioned above, the climate issue is often addressed in vague terms as part of an ESG questionnaire, making it impossible to convey the complexity of the strategies used.

That said, the process of replying to the questionnaire is useful for some companies because it allows them to improve the way they address "climate" issues and consequently fine-tune some of their practices.

Finally, regarding climate change, this process seems to be in a transitional phase in which issuer reporting is improving as new reporting regulations come into effect (especially in France), and in which the agencies are adjusting their questionnaires (with greater use of the management report). The specific nature of "climate" as a separate issue (unlike "ESG") and certain methodolo-

⁷⁵ Essentially in the context of a top down methodological approach to measuring the carbon footprint as used by some banks.

gical similarities will, over time, hopefully standardise and simplify the approach taken by the agencies.

3.1.3 Data modelling methodologies

Our aim in this section is to describe the main methodological approaches used by organisations that work with *carbon data* (extra-financial rating agencies and *carbon data* providers). We do not take a view as to the quality or relevance of one model or another. There are four families of models currently in use.

1/ "Input-output" methodologies (Economic Input-Output Life Cycle Assessment or EIO). This type of methodology is based on a matrix representation of economic flows (for example the national input-output table). This kind of modelling can be used to analyse the influence of key parameters' variations (production and consumption) affecting a particular sector on other sectors and on final consumption. The result is a representation of the flows between sectors (purchase and sale of products or services from a sector A to a sector B). Without going into detail, the input and the output of a sector constitute the upstream and downstream processes of a company within the sector. By associating each activity with an emission factor, it is possible to infer the total emissions associated with a company's value chain. The chosen sectoral granularity has a significant impact on the quality of results. This is usually the same as in the national tables. The emission factors by activity are also critical to the result. Finally, this methodology does not rely on previously reported data.

2/ "Bottom-up" methodologies. These methodologies are based on an analysis of the physical data of corporate activity (production, sold products, energy mix, etc.). Emission factors are used to determine the associated emissions. This model is used by a number of organisations but to varying degrees (partially in many cases).

3/ Methodologies based on statistical regressions.

This approach takes carbon data that is considered to be valid and generated from a smaller universe and extrapolates it to a large universe. The extrapolation method starts by creating one or more statistical regressions between the non-carbon variables (turnover, number of employees, etc.) for a company and the carbon data of the same company, and then extrapolates the resulting ratios to companies in the same business sector for which a detailed analysis is not possible or available. The validity of the results depends on the quality of the reported data, the allocation, the sectoral granularity and the selected independent variable.

4/ Methodologies based on sector averages. This model is based on the carbon intensity (mainly scope 1 and scope 2) of business sectors. The granularity of the subdivision into sectors has a major impact on the result.

5/ Top-down methodologies: P9XCA⁷⁶ is an example of a carbon footprint estimation methodology which is generally applied to banking portfolios and was developed by academic institutions⁷⁷ with the backing of several French banks.

Organisations which estimate *carbon data* generally use a number of models depending on the input data they have access to. The model based on sector averages is apparently only used as a last resort.

Several different sources also told us they were able to measure the uncertainty of estimated data compared to "real" emissions⁷⁸.

3.1.4 Verification of carbon data

There are two different ways to verify *carbon data* and *climate information*:

- The consistency verification process established by the rating agencies or the data providers to guarantee the quality of the *carbon data* they are using.



- The audit (as true and fair) of the extra-financial performance statement, by an independent third-party body (usually an auditor).

3.1.4.1 Process of verification

The *carbon data* disclosed by issuers may include errors, inconsistencies or aggregations which need to be verified in order to offer consistent data. There are several possible causes:

- The accounting standard or methodology used by the issuer (emission factors, accounting norms, unit of measurement, greenhouse gases considered).
- The scope of the emissions, which may exclude certain items, certain countries or certain subsidiaries.
- Major variations from one year to the next caused by simple errors (typing error or first publication for example).

To deal with this, organisations producing carbon data establish verification processes which are predominantly based on the following elements:

- A review of the data compared to the average values for the sector, either automatically or manually by the analyst, in order to identify suspect values.
- Clarification with the issuer.
- A comparison of the reported data with the estimation model (if there is one) or an acceptability threshold.

In fact, for organisations using declared *carbon data*, a significant part of the data is apparently modified. For example, for the scope 1 emissions data of companies in the STOXX 600 Europe index, *Trucost* has announced that only 50% of the data declared by all issuers is used without adjustment. As mentioned earlier (see 2.3.3. CDP (formerly the Carbon Disclosure Project), p.31), the carbon data declared voluntarily to CDP is inevitably of variable quality. To date, CDP does not perform any verification (CDP never has access to the details of the calculations or the input assumptions) and goes no further than asking issuers for documents backing up the declared data⁷⁹.

3.1.4.2 Verification of data by independent third-party bodies

French law⁸⁰ states that the extra-financial performance statement contained in the management report must be verified as true and fair by an independent third-party body.

Firstly, note that an auditor's level of commitment (or legal liability) when auditing the extra-financial performance statement is the same as for the financial statements.

In our discussions with auditors about carbon data, we learned that verification covers the following:

- 1/ The existence of the data or the reason for its absence according to the "comply or explain" concept.
- 2/ The conformity (i.e. with the selected reference standard) of the calculation protocol used by the issuer and the truth and fairness (i.e. the protocol is applied in good faith) of the data in respect of the protocol.

In other words the auditor does not form a view on the value of the data, but on its consistency with a predetermined calculation benchmark.

With regard to *climate information* (strategy, risk management), the auditor makes sure in general terms that the company has policies to implement the strategy and that these policies are covered by action plans, with progress measured by indicators.

According to the auditors, the leeway left by the legislation for companies (specifically concerning climate risk management, a concept which is not defined in law) may result in inefficiencies.

⁷⁶ This methodology correlates global greenhouse gas emissions (calculated retrospectively by the UNFCCC) with the institutions financing the economy, according to their market share by sector of economic activity and by geographical zone. It allows users to map their exposure to the transition-related "climate" risk on a macro-sectoral basis. At present, there are 8 macro-sectors and 15 geographical zones.

⁷⁷ Université Paris-Dauphine and Ecole Polytechnique

⁷⁹ Mainly for scope 1 and scope 2 emissions. However, China is a good example of how imprecise the estimations can be at the macroeconomic scale: <https://www.theguardian.com/environment/2015/aug/19/chinas-carbon-emissions-may-be-lower-than-thought>

⁷⁹ See the "Climate change" questionnaire of CDP, questions CC 8.6, 8.7 (scope 1 and 2) and 14.2 (scope 3)

⁸⁰ Part II of article R.225-105-2 of the Commercial Code

3.2 Analysis of carbon data and climate information

3.2.1 Climate risk analysis methodologies of the extra-financial rating agencies

Each of the extra-financial rating agencies has developed original methodologies to analyse issuers' ESG and climate risks. Without making a judgement as to the content of the methodologies, we think the following points are worthy of note:

Most of the rating agencies do not restrict their "climate" analysis to an assessment of the carbon footprint – their methodologies include prospective elements (climate risk management, low carbon strategy, reduction targets) to varying degrees.

The chosen approach is nearly always sector-specific. The *materiality* of climate risk is seen as more of an issue for certain sectors. This sector-specific approach feeds through into a higher weighting for "climate" criteria or a larger number of criteria considered. Nevertheless, a single-sector approach when linking companies to methodologies may have some weaknesses (particularly for companies with a presence in multiple sectors or companies in transition).

Climate risk analysis is still included in a weighted approach (for which the weighting of climate depends on its *materiality*) and the "climate" score is not consistent.

Some agencies do not always include scope 3 emissions for all issuers when they assess the carbon footprint of portfolios, nor when they determine the ESG rating. They only use a partial carbon footprint, limited to scope 1 and 2 emissions.

In the absence of *carbon data*, some agencies estimate their own data using a proprietary estimation model, which could also be used in the data verification process.

Even though *scenario* analysis (e.g. 2°C) was strongly recommended by the TCFD, the agencies seem to be holding back, and did not go into detail about how they intend to include it in their rating process.

3.2.2 Carbon footprint and scope 3

An issuer's carbon footprint is the fundamental element in climate risk analysis and remains the most widely used indicator in the area⁸¹. It is a measure of a company's exposure to climate risk – essentially the transition risk – at a precise moment.

The carbon footprint covers direct (scope 1) and indirect (scope 2 and 3, see the Glossary, p.53) greenhouse gas emissions resulting from the company's activities across its whole supply chain. As well as acting as a rating indicator, the (full) carbon footprint remains a strategic analysis tool to assess the company's carbon dependence, also taking account of indirect greenhouse gas emissions (in particular from the supply chain and the use of a company's products).

There is an international standard defining and regulating the carbon footprint measuring methodologies (ISO 14064-1⁸² and ISO 14069⁸³). Note that the ISO 14069 standard almost exactly transposes the Bilan Carbone classification of emissions' sources. Note also that ISO 14064-1 (and ISO 14069) is currently being revised⁸⁴ (to be completed in 2018). As a result, the "scope" concept may be replaced with the concept of "direct and indirect" emissions.

That is why it is indispensable to measure an issuer's full carbon footprint (i.e. including scope 3 emissions) in order to clearly assess the exposure to transition-related climate risk. In this context, disclosure of the issuer's carbon footprint is expressly encouraged by the



TCFD and by the current French legislation (article 173 and transposition of the European directive as described above). The French legislation asks companies to report their “significant items” while letting them use the methodology of their choice.

However, looking further afield than France, it seems that the lack of availability of *carbon data* and its inconsistency are prompting the rating organisations to limit themselves to energy-related emissions (scope 1 and 2), or in some cases to use estimated *carbon data* beyond the control of the companies.

Note: These microeconomic interdependencies between economic agents that emit greenhouse gases directly or indirectly (customers or suppliers) are consolidated into a global, macroeconomic vision of climate risk which is highly systemic.

3.2.3 Avoided carbon emissions

“Avoided carbon” is an indicator designed to measure how solutions developed by a company reduce greenhouse gas emissions. As such, it allows companies to enhance their solutions and products compared to a benchmark situation with higher emissions.

This indicator is generating a lot of interest at the moment. The environmental association EpE (*Entreprises pour l’environnement*) recently published a report defining what is covered by avoided carbon emissions and proposing methodological elements to measure them.

The report contains defining elements including:

- The avoided carbon emissions of a low carbon solution are assessed in comparison with a benchmark solution. The benchmark solution must provide the same performance as the low carbon solution and must also be an alternative to the assessed solution which is recognised, credible and available on the market.
- Avoided carbon emissions are calculated by subtracting the greenhouse gas emissions of the “low carbon”

solution from those of the benchmark solution, calculated over the full life cycle. This necessarily involves devising a benchmark *scenario* (to simulate a future in which the low carbon solution is not used) and an alternative *scenario* (to simulate a future in which the “low carbon” solution is used)

It is still quite rare for the organisations involved in climate risk analysis to use this kind of indicator. There are a number of factors which seem to limit the generalisation of its use, including:

- 1/ Avoided carbon emissions do not always count:** companies can only legitimately claim avoided emissions if they are able to show credibly and unequivocally that their solutions help to reduce overall greenhouse gas emissions. Agencies therefore have to work with an indicator which is not always suitable.
- 2/ The actual calculation of avoided carbon emissions:** even if this kind of calculation is suitable, comparative life cycle analyses still need to be carried out, requiring data – which might not always be readily available – and considerable resources and expertise.
- 3/ Company-level aggregation of avoided carbon emissions:** the benchmark scenario may be different for each low carbon solution, making aggregation tricky at company level if the company offers more than one solution.

⁸¹ The TCFD’s final report states: “Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.” *

⁸² ISO 14064-1 Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. Application of this ISO standard is voluntary. The current version (ISO 14064-1: 2006) of the standard separates emissions into direct emissions (scope 1), energy indirect emissions (scope 2) and other indirect emissions (scope 3). Organisations must consider scopes 1 and 2, whereas scope 3 is optional.

⁸³ Technical Report of ISO 14064-1.

⁸⁴ The working party is chaired jointly by France and China (France is also the secretary).

4/ Avoided emissions allocated among different organisations: users of this indicator may need to consolidate the data at the portfolio level, for example, and the rules allocating avoided emissions must be distributed among the organisations in the value chain of the "low carbon" solution, or else there is a risk of double counting which would skew the result.

These obstacles do not appear to be insurmountable provided the analysis has a well-defined goal and adequate resources are assigned. The data and frame of reference exist already and are available.

Before this indicator can be used effectively, it seems that the sectors must reach a consensus on the methodologies and the benchmarks solutions. This, for example, is one of the conclusions of the EpE's report.

3.2.4 Regulation of financial and extra-financial rating agencies

3.2.4.1 Regulation by ESMA and the issue of methodologies

Following the crisis of 2008, the decision was made in Europe to create ESMA for the general supervision of capital markets. It has an express duty of oversight of credit rating agencies operating in the euro zone, something which could not be guaranteed previously by the national bodies like the AMF in France.

In just a few years, ESMA will produce an impressive corpus of regulations relating to agencies and covering all aspects of this market.

In the USA, since 2006, credit rating agencies have been overseen as Nationally Recognised Statistical Rating Organizations (NRSROs)⁸⁵ by the Office of Credit Rating, a department of the Securities and Exchange Commission (SEC). The American regulatory system was toughened up after the great financial crisis of 2008 with the Dodd-Frank⁸⁶ Act.

Like its American counterpart, ESMA's doctrine and

therefore its oversight activities are not focused on the particular methodology an agency uses to generate its ratings, but on its broader framework.

One fundamental aspect must be taken into consideration here – the nature of the numerous asset segments overseen by ESMA⁸⁷, prompting a series of publications between 2012 and 2016, for example about sovereign risk, which is a particular concern in the euro zone.

Under European law, ESMA will publish a large number of notes, studies and annual reports analysing the credit rating market in Europe, specifically the methodological context, and about the results of its oversight activities (usually anonymised).

3.2.4.2 Financial regulation and climate

In 2017, the European executive wanted to motivate the financial industry to play a more active role in the fight against climate change. In a speech (17/10/17)⁸⁸, the Vice-President in charge of Financial Services Valdis Dombrovskis revealed that the European Commission was planning to give the EU's financial supervisory bodies, including ESMA, a new role in 2018:

"As you know, ESMA emerged as a response to the weaknesses in supervision unveiled by the financial crisis. This crisis cost EU taxpayers over €2 trillion, and showed the need for effective EU-wide supervision. (...) In our review, we made ESAs [Note: ESAs are European Supervisory Agencies, of which ESMA is one] active participants in the fight against climate change. There is a clear and urgent need to mobilise billions of euros of private investment towards green and sustainable goals. The proposal would require ESAs to integrate Environmental, Social and Governance considerations in their tasks."



3.3 Scenarios

3.3.1 Issues on the use of scenarios

The use of scenarios is a major – and recent – conceptual breakthrough in climate risk analysis. Scenario analysis is already used in many business sectors to assess the consequences on a company's business model of a future which is uncertain and potentially disrupted (compared to trend). Scenarios are developed by projecting a set of parameters of different orders (geographical, sectoral) and types (macroeconomic, physical, financial).

Scenarios appear to be a useful climate risk analysis tool, bearing in mind the global, systemic and bounded (e.g. 2°C) nature of climate change, the great uncertainty around how these changes will manifest themselves, and the implementation of transition policies. They can be used to assess the company's viability and prospects in a "low carbon" world affected by a profoundly changed economic environment and physically altered by climate change impacts⁸⁹.

The TCFD strongly recommends certain companies to use prospective analysis methods based on scenarios and to disclose the relevant information. In its final report, the TCFD states the following: "TCFD believes that all organizations exposed to climate-related risks should consider (1) using scenario analysis to help inform their strategic and financial planning processes and (2) disclosing how resilient their strategies are to a range of plausible climate-related scenarios."

The TCFD adds that the most exposed sectors (especially the four exposed non-financial sectors mentioned above, see 1.2.2.2 Task Force on Climate-related Financial Disclosures, p.18) should perform a deeper scenario analysis, including the potential financial implications of this kind of analysis⁹⁰.

This unprecedented recommendation⁹¹ has raised many questions of a strategic nature: the sensitivity of the information handled, the project horizon, the robustness of the assumptions, coverage, sector issues, and comparability issues.

Companies rarely develop ex-nihilo scenarios, and rely on underlying scenarios. While the TCFD clearly recommends that companies rely on IPCC scenarios to assess physical risk, it does not specify which scenarios (in-house or outsourced) should be used to assess transition risks. The only concrete recommendation from the TCFD is that one of the scenarios must be compatible with the 2°C target. The question of which scenarios are chosen, therefore, is a fundamental issue when this kind of analytical tool is used.

Most organisations, including the TCFD⁹², regard the scenarios of the IEA (International Energy Agency), which draw on costly resources and great expertise, as underlying benchmark scenarios⁹³. The IEA scenarios do have flaws, however, especially in terms of their assumptions and methodology. And the IEA's monopoly in the production of energy scenarios is an issue.

⁸⁵ Nationally Recognised Statistical Rating Organization (NRSRO)

⁸⁶ "Subtitle C mandates the creation by the SEC of an Office of Credit Ratings (OCR) to provide oversight over NRSROs and enhanced regulation of such entities."

⁸⁷ For example: European Court of Auditors – Special report 2015 - EU supervision of credit rating agencies – well established but not yet fully effective "For the three largest CRAs, ESMA counts more than 800 methodologies for different asset classes and market segments."

⁸⁸ Valdis Dombrovskis 17 October 2017 Speech for ESMA Conference 2017 - Paris

⁸⁹ In its final report, the TCFD states the following: "Scenarios are hypothetical constructs and not designed to deliver precise outcomes or forecasts. Instead, scenarios provide a way for organizations to consider how the future might look if certain trends continue or certain conditions are met."

⁹⁰ The final report of the TCFD states the following: "Organizations with more significant exposure to climate-related issues should consider disclosing key assumptions and pathways related to the scenarios they use to allow users to understand the analytical process and its limitations. (...) As a result, the Task Force believes that organizations with significant climate-related exposures should strive to disclose elements [including] (...) Information about the resiliency of the organization's strategy, including (...) potential material financial implications for the organization's operating results and/or financial position."

⁹¹ As seen in the document published by IHS Markit ("Climate-Related Financial Risk and the Oil and Gas Sector", May 2017).

⁹² The final report of the TCFD states the following: "The most well-known and widely used and reviewed scenarios for transition to a low carbon economy are those prepared by the IEA. A majority of analyses conducted by academic and industry analysts are built upon or compared with the IEA scenarios."

⁹³ The IEA, an international organisation linked to the OECD, enjoys 1/ a decade's head start 2/, significant expertise, crucial from an energy perspective, 3/ considerable resources that can be devoted to the area.

Most financial and extra-financial rating agencies and data providers are still lagging behind when it comes to *scenario* analysis, in particular how it fits into the rating process and how to build their own sector-based *scenarios*.

3.3.2 The Science Based Target initiative (SBT) or the sector-based approach to scenarios

The Science Based Target (SBT) initiative is a partnership between CDP, UN Global Compact, WRI (World Resources Institute) and WWF (World Wide Fund). The number of companies participating in SBT is growing fast (+25% since January 2017)⁹⁴. CDP, a SBT founder, is heavily involved in the project (which accounts for some of its budget), especially on the technical side. ADEME is a member of the Technical Advisory Group of SBT .

The SBT initiative is a highly ambitious project which aims to determine whether the companies' greenhouse gas emissions reduction targets are compatible with the "scientific" 2°C target adopted by the Paris Agreement.

A set of methodologies is available now, developed externally or sometimes by the companies themselves and based on various analytical approaches.

SDA (Sectoral Decarbonization Approach) is by far the most widely used method, and is based on a sector-based allocation of the overall "carbon" budget within the target of 1000 GtCO_{2eq} (see 1.2.2. Systemic risks within a well-defined time frame, p2). This sector-based allocation is inherently very complex and, if it is to succeed, requires very considerable analytical resources and expertise in order to address a highly systemic subject. A certain number of sectors are already covered by this approach. It is being extended to other sectors (such as finance) although there seem to be problems with methodologies.

The SBT initiative claims to have a "scientific" approach.

To achieve "scientific" standards, however, many questions need to be answered about methodologies and how they are implemented, the assessment process, and the transparency and traceability of the information. As things stand, the governance of this initiative and the underlying economic model have not stabilised.

IEA *scenarios* are used as reference *scenarios* in SBT methodologies. **The technical advisers of the SBT initiative are aware of the limits of these *scenarios***, but consider this to be a secondary issue. They think it is more important for companies to act by setting robust and verifiable targets in line with the 2°C limit.

The Caisse des Dépôts appeared to be very interested in the SBT initiative and encourages the companies it invests in to sign up, while remaining cautious about the governance issues in this ambitious international initiative.

⁹⁴ Although by the end of November 2017, only 25% of the 326 companies which signed up had their targets validated. Note that involvement in the SBT initiative adds a certain number of points to the "CDP score"



Feedback from
discussions with a
a selection of
contributing
AFEP companies

The discussions with a selection of AFEP member companies very much fed into the ideas formulated in this document. Below we group by subject area the most salient points that allowed us to create analytical frameworks for the rating organisations.

Collection process for climate information and carbon data.

- 1/ On the whole, the process of responding to the questionnaires is useful for most companies because it allows them to improve some of their practices and the way they address climate issues (or ESG more broadly).
- 2/ Most companies find that it takes too long to reply to questionnaires and as things stand, the differences between the numerous questionnaires mean that significant resources must be deployed. These companies also find unfortunate that the rating organisations do not always perform an initial analysis of the data disclosed in their company reports.
- 3/ For most companies, it is unfortunate that the questionnaires they receive are often inadequate and do not allow them to convey the complexity of the strategies they are using (rigidity of the questionnaires and a “standardised” approach with closed questions, focus on risks rather than opportunities).
- 4/ The CDP Climate Change questionnaire is seen by some companies to be the most meaningful on climate change issue. However, issues remain around the declaration-based approach, the lack of verification of the data declared (by certain peers) and

the logic of the questionnaire which allows points to be optimised in ways that are sometimes dubious, etc.

Analysis of climate information and carbon data.

- 1/ For most companies, the analysis is not yet felt to have sufficient depth and detail. Some companies stressed the shortage of resources allocated to analysis by the rating organisations and the lack of sector-specific knowledge, and they worry about the analysis becoming increasingly “automated”. Some companies also regret the secrecy surrounding the rating process, preventing them from identifying potential improvements.
- 2/ All companies say that the extra-financial rating (these days including climate) seems to have relatively little impact on investors. For now, any impact is essentially reputational.
- 3/ Regarding CDP, most companies agree that ratings based on “the formal quality of disclosure” are gradually evolving toward ratings based on the issuer’s performance.

Governance and relationship with issuers.

- 1/ All companies stress the importance of a relationship built on quality and confidence between the “rater” and the issuer. Most companies accept that, at present, relations with the extra-financial rating agencies are difficult. Most companies indicate that their confidence in the agencies is reduced by the fact that they provide consulting services alongside their rating activities.

- 2/ Most companies note that the model in which investors pay for ratings is not sound. This limits the expertise and resources the agencies put into the extensive data collection, analysis and assessment they claim to carry out.
- 3/ Most companies question the monopoly position of CDP, which is becoming increasingly evident, and the governance of this organisation, of which few details are available.

Methodologies.

- 1/ For most companies, the issue of *scenarios* raises many questions of a strategic nature: the project horizon, the sensitivity of the information disclosed, the robustness of the scenarios used, sector issues. For some companies, it is important to link their strategic focus to the 2°C target fixed by the Paris Agreement.
- 2/ The SBT initiative raises many questions for most companies:
 - About the technical content, the methodologies (to which they do not feel they have sufficient access), and the scenarios underpinning the methodologies (IEA scenarios). These scenarios determine the sectoral allocation of a carbon budget, and they are seen as more successful and more complete, although they appear to be based on technical and

economic assumptions that correspond to a particular world view.

- About the governance structure of the SBT initiative and the role of the stakeholders in developing and promoting corporate assessment methodologies (CDP, WWF, WRI etc.).
- 3/ For most companies, scope 3 remains a complex subject. Assessing scope 3 is a delicate process in some specific sectors and specific activities.
 - 4/ For most companies, the “avoided carbon” indicator is a good way for them to enhance their strategic focus with regard to climate. However, these companies note that the concept must be made more reliable and that few agencies even use the indicator.



Appendices

Glossary

Material (or Materiality): a risk is said to be “material” if it is significant and relevant.

Carbon data: greenhouse gas emissions measured in tonnes of CO₂ equivalent. These emissions can be scope 1, scope 2 or scope 3:

- Scope 1 emissions are directly linked to the activities of an organisation.
- Scope 2 emissions are indirectly linked to the energy consumption (electricity and heating) of an organisation.
- Scope 3 emissions are indirectly produced by an organisation’s activities which are not included in scope 2 but are linked to the end-to-end value chain of the activities, upstream as well as downstream.

Climate information: this term covers all remaining information disclosed by companies and related to climate change (low carbon strategy, climate risk and opportunities management, etc.).

Intermediated/disintermediated finance: intermediated finance means finance originating in banks. The company applies to a financial intermediary for funding, which provides it with the capital it needs to grow in the form of loans. Disintermediated finance means obtaining this capital on the financial markets without an intermediary.

Physical climate risks: group of risks associated with physical disruption caused by climate change, such as the increasing frequency and intensity of weather events, local alteration of water resources, a change in the public health environment, or a rise in sea levels. These changes might entail economic, political and social upheavals that are likely to be increasingly serious.

Transition-related climate risks: group of risks arising from the process of adjustment to a low carbon economy. Policy changes, new production methods and energy consumption patterns, technological and physical risks might trigger a revaluation of a large range of assets and a reassessment of corporate strategies as the transition takes place.

Scenario: a tool designed to simulate an uncertain and potentially disrupted future, by varying in a coordinated way a number of parameters of different orders (geographical and sectoral) and types (macroeconomic, physical, financial). In particular, this tool can be used to analyse and predict the consequences of several different “futures” on a company’s business model and environment.

List of abbreviations

AFD: French Development Agency [Agence Française de Développement]

AMF: French Market Authority [Autorité des Marchés Financiers]

CDP: Carbon Disclosure Project. CDP is now a registered trademark

CNCC: Institute of Statutory Auditors [Compagnie Nationale des Commissaires aux Comptes]

CNI: Carbon Neutral Investments, formerly a subsidiary of South Pole Group, now ISS Ethix Climate Solution

COFRAC: French Accreditation Committee [Comité français d'accréditation]

DJSI: Dow Jones Sustainable Index

ESMA: European Securities and Markets Authority

ETF: Exchange-Traded Fund

FSB: Financial Stability Board

GFSG: Green Finance Study Group

GRESB: Global Real Estate Sustainability Benchmark

IEA: International Energy Agency

I4CE: Institute for Climate Economics

IMF: International Monetary Fund

IPCC: Intergovernmental Panel on Climate Change

ISS: Institutional Shareholder Services

LTECV: French Energy Transition for Green Growth Act of 17/08/2015 [Loi relative à la Transition Energétique pour la Croissance Verte du 17/08/2015]

OTI: Independent Third-Party Body [Organisme Tiers Indépendant]

SASB: Sustainability Accounting Standards Board

SDA: Sectoral Decarbonization Approach

TCFD: Task Force on Climate-related Financial Disclosures

UNFCCC: United Nations Framework Convention on Climate Change

WRI: World Resources Institute

WWF: World Wildlife Fund



List of participants by category

Organisations

Contacts

Credit rating agencies

S&P Ratings

Moody's

Dimitri SEDOV ; Frédérique LANGE ; Mike WILKINS ; Pierre GEORGES

Yasmina SERGHINI

Extra-financial rating agencies

Vigeo-Eiris

MSCI ESG Research

Oekom Research

RobecoSAM

Fouad BENSEDDIK ; Elise ATTAL ; Marcos RAMOS MARTIN

Véronique MENOUE ; Marion de MARCILLAC

Julia HAAKE

Nicolas BENETON

"Carbon" data providers

Carbon4finance

Trucost

ISS Ethix Climate Solutions

CDP

Alain GRANDJEAN ; Jean-Yves WILMOTE ; Matthieu MAURIN

Jean-Florent HELFRE

Maximilian HORSTER

Pedro FARIA ; Laurent BABIKIAN

Index providers

S&P DJI

MSCI

Martina McPHERSON

Véronique MENOUE

Auditors

E&Y

PWC

Chambre Nationale des Commissaires
aux Comptes

Caroline DELERABLE ; Julien PEREZ ; Alexis GOZZO

Sylvain LAMBERT

Jean BOUQUOT

Public and quasi-public organisations

AMF

High Level Expert Group on Sustainable Finance

Direction Générale du Trésor

CGDD

ORSE

Caisse des dépôts

ADEME

TCFD/HLEG

Patrick SIMION ; Maryline DUTREUIL-BOULIGNAC

Philippe ZAOUATI

Jean BOISSINOT

Priscille GHESQUIERE ; Dorine LAVILLE

Daniel LEBEGUE ; Géraldine FORT ; Michel LAVIALE

Nicolas BLANC ; Joël PROHIN

Romain POIVET

Christian THIMANN

Other

2°C Investing Initiative

Initiative SBT

Stanislas DUPRE ; Thomas BRASHI

Pedro FARIA

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Report authors

Romain Grandjean is a project engineer for the think tank *The Shift Project*. Graduate of Arts & Métiers ParisTech and IFP School. He previously worked for many years in a large oil company.

romain.grandjean@theshiftproject.org

Michel Lepetit is a vice-president of the think tank *The Shift Project*. Graduate of the École Polytechnique. He is an independent director of a life assurance company and of an engineering company, and formerly a senior executive in banking and financial corporations. He is president of the Global Warning consultancy, research fellow at the Interdisciplinary Laboratory for Tomorrow's Energies (LIED) and expert for Chair Energy and Prosperity.

michel.lepetit@theshiftproject.org

Laurent Morel is a director of the think tank *The Shift Project*. Graduate of École Centrale Paris. He is a company director (in cars, industrial vehicles, commercial property, finance) and was chairman of the management board of the Klépierre Group (2009-2016) before joining Carbone 4 as partner.

laurent.morel@theshiftproject.org

Contacts

For *The Shift Project* :

Jean-Noël Geist - *The Shift Project*
Responsible for Public Affairs

jean-noel.geist@theshiftproject.org

For AFEP :

François-Nicolas Boquet
Director for environment, climate
and energy

fn.boquet@afep.com
environnement@afep.com



afep.com

French association of large companies

11 avenue Delcassé
75008 Paris
+33(0)1 43 59 65 35

4-6 rue Belliard
1040 Brussels
+32(0)2 219 90 20

theshiftproject.org

The Shift Project - The carbon transition think tank

54 rue de Clichy - 75009 Paris - +33 (0)1 76 21 10 20

