Finance Watch

Making finance serve society

Breaking the climate-finance doom loop

How banking prudential regulation can tackle the link between climate change and financial instability

A Finance Watch report

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"Faced with sets of events that are complex, subject to radical uncertainty but with the likelihood of a massive future impact, Green Swans call less for improvements in risk modelling and more for decisive and immediate action and coordination"

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Executive summary

Tackling financial instability induced by climate change

Urgent action is needed to tackle the climate-finance doom loop, in which fossil fuel finance enables climate change, and climate change threatens financial stability. Action by regulators and supervisors so far has not been able to break this dynamic, partly because of the difficulty of modelling the risks that climate change poses to financial stability. This report argues that risk modelling is not a prerequisite for tackling the climate-finance doom loop and that regulators already have the economic understanding of the situation, the legal basis and the regulatory tools needed to intervene immediately.

The global carbon budget will be exhausted within 10-15 years. All new fossil fuel production and a significant part of production out of existing reserves are incompatible with Paris goals to limit global warming to 1.5°C. Banks are an important source of funding for this production, witness the $2.7 trillion provided to the oil and gas industry in the four years after the Paris Agreement.

The climate-related disclosure framework emerging from EU sustainable finance regulation captures the two-way nature of the climate-finance doom loop, where finance both enables devastating climate change and will itself be devastated by climate change. But transparency measures cannot reduce on their own the macro-prudential risks that fossil fuel financing causes by enabling climate change, if anything because private agents are not responsible for the public interest.

Financial regulators and supervisors have come far in recognising the threat climate change represents for financial stability. But their actions so far, useful as they are, have been focused mainly on transparency measures and stress tests. In the best of cases, more effective prudential interventions will take years to enter into force, by when the planet's carbon budget will be nearly exhausted.

Climate stress tests are effectively scenario-based analyses looking at how financial institutions will fare in different climate change scenarios, but they do not derive conclusions regarding the solvency of institutions. Incidentally, they seek to assess transition risk and, for some of them, physical risk but not the risk of disruption as businesses, finance and insurance providers will respond to adverse new conditions. These second-round effects can be large, unpredictable and non-linear, as the Covid-19 crisis has shown, and are almost impossible to model.

The lack of prudential action so far is grounded in a paradox: policy-makers recognise the near-impossibility of modelling climate-related risks but say that they need such modelling to be done before intervening. Unfortunately, given the short time available, late action is equivalent to doing nothing.

Climate change will have a significant impact on financial stability. Policy-makers should act now using tools already available rather than waiting to assess unquantifiable risks before acting. As a number of central bankers have noted, the situation calls for less modelling and more decisive and immediate action and coordination.

In this context, the EU must take preventive action as it is bound to do under the Treaty on the Functioning of the European Union, which establishes the precautionary principle as one of its governing principles.

The most suitable tool to do so is prudential measures targeted at banks with assets at risk of being stranded and that contribute to climate-related macro-prudential risk. The EU's Capital Requirements Regulation (CRR) is designed to prevent financial instability and provides, among other things, for higher

risk weightings in situations where the risk of loss cannot be measured precisely even if its occurrence is certain.

Applying higher risk weights to existing exposures to fossil fuel assets, which are at risk of stranding, would be consistent with the approach taken in Article 128 of CRR2 of applying 150% risk weights to exposures associated with risks that are particularly high or difficult to assess.

New fossil fuel exposures, on the other hand, create a macro-prudential risk by accelerating climate change and a larger micro-prudential risk of becoming stranded. Article 501 of CRR2 could be adapted through a risk weight chosen qualitatively, rather than attempting to measure the unquantifiable macro-prudential risks resulting from climate change. Applying a risk weight of 1250% to new fossil fuel exposures under the standardised approach with a similar floor for internal models would make these activities entirely equity-funded, an appropriate treatment for assets with the micro- and macro-prudential characteristics described above.

Given the time needed to amend legislation, the European Commission should immediately activate Article 459 of CRR to apply these risk weights until they have been inscribed in Articles 128 and 501 of CRR2, as part of the 2020 review of the Banking Package agreed in December 2018.

Given the global nature of the problem, the actions suggested to EU policy-makers in this report also need to be presented for use in other jurisdictions via the Basel Committee for Banking Supervision (BCBS) and the Financial Stability Board (FSB).

Our recommendations to target the doom loop between climate change and financial stability are far less radical and much cheaper than the actions taken in response to the Covid-19 crisis, but they target a far bigger threat for which policy-makers are already empowered and equipped to act.

Recommendations

Why

The world is on a path of accelerated human-induced climate change linked to greenhouse gas emissions, and **central bankers all over the world agree on the fact that climate change represents a major threat to financial stability.**

As the main provider of finance to the fossil fuel industry, **bank lending is the de facto enabler of global warming.** Given the destabilising effect that climate change will have on the financial system, **the situation is therefore one of a doom-loop where finance has become the enabler of a phenomenon that will end-up destroying it.**

Regulators, supervisors and central bankers have undertaken an important workstream to better understand and evaluate the impact of climate change on the financial system. However, regardless of the importance and the relevance of this push, policy-makers should be aware of the fact that it will not be sufficient on its own to tackle the issue. **In that context, Article 191 of the Treaty on the Functioning of the European Union (TFEU) sets out the Union's policy on the precautionary principle and refers explicitly to the duty of combatting climate change, requiring EU policy-makers to take preventive action in the case of risk.**

The recommendations of this report address the financial stability implications of banks' lending activity to the fossil fuel industry. They aim to tackle both the macro-prudential and the micro-prudential risks induced by the situation. **As such, they bring a solution to EU policy-makers to take the action they need to take under Article 191 TFEU.**

What

1 Calibrate the risk weight for bank exposures to existing fossil fuel reserves at 150% in order to make it coherent with Article 128 of the Capital Requirements Regulation (CRR) (page 31)

2 Calibrate the risk weight for bank exposures to new fossil fuel reserves at 1250% in order to make the financing of new fossil fuel exposures by banks entirely equity-financed to reflect both micro-prudential and macro-prudential risks (page 32)

3 Ensure that the modified risk weights are reflected in banks' internal models for the purpose of calculating capital requirements (pages 32 and 33)

How

4 The European Commission should use without delay the power given by Article 459 of CRR to take action by issuing delegated acts *"to impose, for a period of one year, stricter prudential requirements for exposures where this is necessary to address changes in the intensity of micro-prudential and macro-prudential risks"*. In the current context of obvious change in the intensity of micro-prudential and macro-prudential risks, activating Article 459 would allow the European Commission to take immediate action and implement the modified risk weights until banks' prudential requirements for fossil fuel exposures have been amended in CRR (pages 34 et 35)

5 Amend the risk weights for banks' existing fossil fuel exposures in Article 128 of CRR and for banks' new fossil fuel exposures in Article 501 of CRR (page 37)

6 Promote the adoption of similar prudential requirements globally by engaging the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB) (page 40)

Introduction

A curious combination of certainty and uncertainty

The impact of climate change on economic and financial systems is somewhat of a paradox in the way it combines certainty and uncertainty.

Four things are certain about the impact of climate change on economic and financial systems:

1. Climate change is happening, it is directly linked to human-induced greenhouse gas (GHG) emissions, and humanity can only continue to emit GHG at the present rhythm for a period comprised between 10 and 15 years before it becomes too late to keep global warming "well below" 2°C, as targeted by the 2015 Paris climate agreement.
2. Once global temperatures have risen above 2°C relative to pre-industrial levels, we will enter uncharted territory, with enormous and unpredictable negative consequences on human societies and the global economy[1] building up during the following decades.
3. Finance, by its very nature, is an enabling factor of anthropogenic climate change: by allocating capital to fossil fuel exploration, production and exploitation, finance is the principal vector enabling global warming. Finance itself does not create global warming, but it makes it possible.
4. Given the consequences that climate change will have on the economy, it is now widely recognised by central bankers that climate change represents a most significant risk to financial stability[2] to the extent that it could threaten the entire financial system.

If the direction of travel of climate change is considered today as certain by the scientific community and by rigorous observers, measuring its impact on the economy and on the financial system is, however, considered in the best of cases as "uncertain" or "challenging" by some,[3] and as "impossible" by many others.[4] When it comes to climate change, we are not able to give answers to simply formulated and essential questions: how can we quantify the impact of climate change on the economy and on the financial system? Can we evaluate precisely the so often-discussed transition risk and physical risk incurred by financial institutions due to climate change? Do we understand how the interconnection of financial institutions will contribute to spreading climate-related financial risk? How do we take into account second or third round effects on the economy when it comes to quantifying the impact of climate change? When will the tipping point happen?

Let us make a long story short: for all the science that mankind can pour into quantifying the impact of climate change on economic and financial systems, we will never be able to measure it with the level of confidence that decision-makers like to have to take action. The reason for this is simple to understand: we are not dealing with risk but with uncertainty. Evaluating risk in general, and financial risk in particular,

1 See, for instance, Intergovernmental Panel on Climate Change's fifth assessment report - 2014

2 See, for instance, François Villeroy de Galhau, foreword to "The green swan" - January 2020: "Climate-related risks could therefore threaten central banks' mandates of price and financial stability, but also our socio-economic systems at large.", Christine Lagarde "*It is difficult to disagree that climate change is a threat to financial stability*" - January 2020, and Mark Carney "*Breaking the tragedy of the horizon – climate change and financial stability*" speech - September 2015.

3 See, for instance, Bolton, Despres, Pereira da Silva, Samama, Svartzman – BIS, BdF – *The green swan* - 2020

4 See, for instance Chenet, Ryan-Collins, van Lerven – IIPP, UCL - *Climate-related financial policy in a world of radical uncertainty* – 2019, or Grandjean, Giraud – Chaire Energie et Prospérité – *Comparaison des modèles météorologiques, climatiques et économiques : quelles capacités, quelles limites, quels usages ?* - 2017

is complex but feasible. A lot of work has gone into the subject over the past decades and, if measuring risk is not an exact science, it has become rigorous enough for its results to be used with a reasonable degree of confidence. In contrast, evaluating uncertainty is an oxymoron: uncertainty is, by definition, not measurable. Very much as the future history of mankind cannot be predicted by a model, very much as nobody would have predicted that the appearance of a new virus in central China would provoke a worldwide depression and threaten global financial havoc, measuring the impact of global warming on economic and financial systems is an unrealistic dream. The only thing we know is that climate change is going to strike, and that when it strikes it will hurt, and badly so. If anything, the Covid-19 pandemic demonstrated the fragility of our globally organised economic system. Without doubt, the impact of global warming, once we have gone beyond the tipping point, will be of another magnitude even if we cannot quantify it.

The situation is therefore an unusual combination of an absolute certainty on the direction of travel and its dire consequences, and of an absolute uncertainty on the quantification of what will happen beyond the tipping point. Policy-makers, regulators and academics alike are not equipped to deal with such an unusual situation. Their usual way of approaching the world is to analyse a prevailing situation, including relevant data, and to extrapolate into the future to get a sense of what will happen, before deciding the measures to take. Unfortunately, despite the fact that the climate change situation is altogether different, they are currently trying to use the same recipe, i.e. evaluate first to then take the right decisions. But this will not work: history and data cannot tell us anything about the state of the world "beyond the global warming tipping point" for the simple reason that we have never been there. Policy-makers and regulators have to realise that when it comes to climate change, deciding to wait for the right measurement before acting is equivalent to deciding to do nothing or to waiting idly for the disaster to strike. Good intentions will not be sufficient.

With a remarkable lucidity and a terrible honesty, the Governor of the Banque de France François Villeroy de Galhau recognised in his foreword to *The green swan* that *"despite this growing awareness (of the impact of climate change on financial stability and socio-economic systems at large) the stark reality is that we are losing the fight against climate change"*[5]. This policy paper looks for a way to change this. Its focus is on banking and it proposes a realistic action plan for policy-makers to act now. It describes what we call the climate-finance doom loop, whereby finance has become the enabler of the coming climate change disaster and will be destroyed in return by the consequences of climate change (chapter 1), summarises what supervisors are doing... and not doing today to tackle the issue (chapter 2), exposes the necessity and the legitimacy of using prudential regulation as a financial stability tool (chapter 3), gives an economic description of the measures that need to be taken to break the climate-finance doom loop (chapter 4), and finally opens the prudential regulatory tool box at the disposal of EU authorities to implement the necessary measures (chapter 5). Its conclusion emphasises the collective inaction bias we have to overcome, and it broadens the debate beyond banking and beyond the borders of the European Union, as the debate concerns also non-banking financial actors and is obviously global.

Acting now is not an option but an obligation. We have the tools to tackle today the dual and destructive relationship between finance and climate change. Policy-makers have to decide whether or not they want to use the tools they have at their disposal.

5 BIS, Banque de France - *The green swan*, January 2020

Chapter 1
Introducing the climate-finance doom loop

Finance makes climate change possible and will be destroyed in return by the consequences of climate change

I. It all starts with human-induced global warming

The work done by the Intergovernmental Panel on Climate Change (IPCC) since 1988 is instrumental to our understanding of climate change. The IPCC describes itself[6] as the United Nations body for assessing the science related to climate change. Leaving aside a few sterile controversies coming from parties with a vested interest in not tackling climate change, the IPCC has demonstrated scientifically not only that climate change is a reality, but also that it finds its origin in human activities and that it will have a huge impact on the planet and on human societies.

The fifth assessment report of the IPCC published in 2014 established with 95%-100% probability (we call it certainty) the anthropogenic nature of global warming, and left no doubt that greenhouse gas (GHG) emissions were the heart of the problem. Three assertions contained in IPCC's fifth assessment report are the roots of the directions taken by this report:

1. Reversing greenhouse gas emissions is the only tool at the disposal of mankind to limit global warming *"The overall risks of climate change impacts can be reduced by limiting the rate and magnitude of climate change"*.
2. Without new policies to mitigate climate change, and given the current trend of GHG emissions (i.e. including their continued upward trend), we are on a global warming path comprised between 3.7 and 4.8°C by 2100 (with a range of median values between 2.5 and 7.8°C).
3. The greater global warming gets beyond the level of 1.5° or 2°C (that we are most likely to miss), the more severe the impacts will be. In other words, action is not only about not hitting the + 1.5° or the + 2°C threshold but, as importantly, limiting global warming as much as we can beyond that point.

The notion of carbon budget:

The notion of carbon budget is central to any reasoning on tackling human-induced global warming.

The Carbon Tracker Initiative, a non-profit organisation that carries out analysis on the impact of the energy transition on capital markets and financial assets, gives the following explanation of the carbon budget concept:

Box 1 – Carbon Budgets

Extract from the Carbon Tracker Initiative website[7]

Global warming is fundamentally linked to the absolute concentration of greenhouse gases in the atmosphere. To stabilise global temperature at any level vs pre-industrial, then there is a finite amount of emissions that can be released before net emissions need to reach zero – this can be referred to as a carbon budget.

6 Website of the Intergovernmental Panel on Climate Change (IPCC)

7 Carbon Tracker Initiative website

Carbon budgets continue to be a popular approach to frame the challenge of keeping global warming to 'acceptable' levels. The IPCC Special Report on Global Warming of 1.5ºC (2018) is the most recent authority on 'total' carbon budgets – meaning the total amount of emissions that can be released and hence contribute to warming across all sectors of the economy (which can be categorised as energy sector emissions plus land use, land use change and forestry plus industrial sector emissions). Other sector-specific CO2 estimates for a given warming outcome may also be published by various organisations, for example the energy sector CO2 emissions published by the IEA.

At the 2015 UNFCCC Paris COP, world governments confirmed their intention to limit global warming "well below 2°C" and pursue efforts to "limit the temperature increase to 1.5°C". We calculate that the remaining 1.5°C carbon budget was c.495GtCO2 as at the beginning of 2020 (based on the carbon budgets updated by the IPCC in 2018 and emissions data from the Global Carbon Project). Based on 2019 emissions of 43.1GtCO2 this budget can be expressed in terms of years remaining at current emissions levels – as of 2020 this equates to 11.5 years for a 50% probability of a 1.5°C warming outcome.

Carbon Tracker's 2019 report Balancing the Budget discusses global carbon budgets further, and translates these to company carbon budgets for upstream oil and gas companies based on IEA fossil fuel demand scenarios using a least-cost approach.

A number of uncertainties exist as to the actual carbon budget of the planet. Those uncertainties are linked to different factors, including the probability level considered for the global warming outcome, whether carbon budgets are considered for CO2 only or for all GHG emissions, and hypotheses such as the potential release of methane from thawing permafrost. Strikingly, and regardless of the hypotheses and scientific debates, the range of carbon budgets calculated is between 10 and 15 years. This range can be seen as wide from a scientific standpoint if expressed as a percentage, but from a human standpoint it is actually very narrow: it tells us that the planet's carbon budget will be exhausted very soon and on a time horizon that can only be considered as very short, even on the scale of a human life.

We are witnessing today an absurd situation where we know that the current rate of GHG emissions leaves us only between 10 and 15 years to avoid a global warming that will lead to a major disruption of human societies (potential consequences being droughts, heat waves, rising sea levels, famines, massive migrations of populations, pandemics…) and, subsequently, to financial instability but, despite the certainty of the coming disaster, we keep accelerating towards the point of no return. By investing in new fossil fuel fields and facilities, not only do we create the conditions for exhausting the earth's carbon budget even more quickly than would be the case by "only" sticking to current production levels, but we are also preparing a global warming well above the Paris agreement target. Notwithstanding the possibility, or impossibility, of limiting global warming "well below" 2°C as the objective of the Paris agreement goes, we are putting ourselves on a path to a global warming well above 2°C that will spell even greater woes for humanity. As the fifth assessment report of the IPCC reminded us, it is not only a case of limiting global warming below 1.5° or 2°C but, almost as importantly, of limiting the rate and magnitude of global warming beyond 1.5° or 2°C, as this will reduce the negative consequences of climate change for the planet and for human societies. The hotter the planet will become, the more dreadful the consequences.

II. The role of finance in the acceleration towards climate disaster

In this context, we have to question the role of financial firms in making the climate change situation possible and, as importantly, reflect on the consequences of this role on their own resilience, on their ability to continue to operate and, more generally, on the stability of the financial system.

On 23 April 2019, Global Witness produced a report titled "How the IPCC's 1.5°C Report demonstrates the risks of overinvestment in oil and gas"[8].

The report shows that oil and gas companies will invest $ 4.9 trillion over the coming decade to expand their production, and that these investments are not compatible with the objective of limiting the world's global warming to 1.5°C as targeted by the 2015 Paris agreement.

The Global Witness report makes strong points, not only on the fact that the capital invested today and tomorrow into the oil and gas industry will be wasted, as it is not compatible with limiting global warming, but also on establishing that possible technological solutions such as carbon capture and storage or carbon removal are currently deployed on a negligible scale and will not, under any plausible scenario, make a significant difference when it comes to limiting the world's greenhouse gas emissions. The experts from major oil companies that we could question confirmed this assertion.

Box 2 – The risks of overinvestment in oil and gas

Extract from the Global Witness website[9]

Overinvestment in oil and gas creates risks for investors, regardless of whether the world is effective in tackling climate change. Either investors face assets being stranded as demand for fossil fuels falls in a transition to a low carbon economy, or the overinvestment contributes to excess emissions from fossil fuels, the failure to transition and the financial costs of a dramatically changed climate.

This report assesses what the Intergovernmental Panel on Climate Change (IPCC)'s landmark report on 1.5°C means for the future of investment in the upstream oil and gas industry. By comparing data from the IPCC's climate models with forecasts from industry analysts Rystad Energy, this report demonstrates the degree to which future production and capital expenditure (capex) is incompatible with limiting warming to 1.5°C.

In October 2018, the world's leading authority on climate change published its groundbreaking report on limiting warming to 1.5°C, the temperature goal of the Paris climate agreement. The IPCC's report demonstrated, unequivocally and comprehensively, the enormous risks from climate change that remain if warming reaches 2°C and the significant benefits of limiting warming to 1.5°C. The IPCC also found that limiting warming to 1.5°C is still possible if ambitious action is taken now, drawing on a range of climate scenarios demonstrating how that goal could be achieved.

Capital investment in new fields is incompatible with 1.5°C

Our analysis compared average oil and gas demand in the IPCC scenarios that are not reliant on high levels of future carbon capture or removal with industry production forecasts. It found that over the next decade:

- Any production from new oil and gas fields, beyond those already in production or development, is incompatible with limiting warming to 1.5°C;
- All of the $4.9 trillion forecast capex in new oil and gas fields is incompatible with limiting warming to 1.5°C; and,
- 9% of oil and 6% of gas production forecast from existing fields is incompatible with limiting warming to 1.5°C.

The oil and gas industry is at a crucial turning point. Capex has fallen by over a third since 2014, largely because of a slump in oil prices. Yet it is forecast to rise by over 85% over the next decade, reaching over $1 trillion a year. Two thirds of that investment is set to take place in new fields where development has not yet started and investments have not yet been sanctioned. Major capex projects that are forecast to be approved in new fields over the next decade include US domestic shale expansion, the Vaca Muerta shale in Argentina, the Kashagan oil field in Kazakhstan and the Yamal megaproject in Russia.

8 Global Witness - How the IPCC's 1.5° C Report demonstrates the risks of overinvestment in oil and gas

9 Global Witness website

The oil and gas majors are set to lead this surge in investment, making up five of the ten largest investors in new fields over the next decade, led by ExxonMobil, Shell and Chevron. In light of our findings, this investment represents a potentially enormous misallocation of capital.

The risky gambles of carbon capture and removal technologies

- **Carbon Capture and Storage** is a technology that captures CO2 at the point of emission (e.g. a power station), preventing it from being released into the atmosphere and then storing it.
- **CDR – Carbon Dioxide Removal** is the process of removing CO2 from the atmosphere.
- **BECCS – Bioenergy with Carbon Capture and Storage** is a CDR technology in which plants are grown (which removes CO2 from the atmosphere), burnt to generate energy, and then the resulting carbon emissions are captured and stored using CCS.

This analysis focuses on IPCC scenarios that do not rely on high levels of future carbon capture or removal because of the significant risks associated with these technologies. Not least is the fact that neither of the main technologies modelled – CCS and BECCS – yet exist at a meaningful scale.

Despite considerable effort, including the commitment of $28 billion of public funds to CCS projects, there are only two operational in the power sector worldwide. Yet both use the captured CO2 to enable further oil extraction, in turn leading to further CO2 emissions.

While CCS has had negligible success to date, some climate scenarios rely on nearly as much CO2 being captured in the 21st Century as has been emitted worldwide since the Industrial Revolution.

CDR also plays a central role in many climate scenarios, yet the IPCC report repeatedly highlights the risks, uncertainties and limitations of CDR deployment at scale. It found that "CDR deployed at scale is unproven and reliance on such technology is a major risk in the ability to limit warming to 1.5°C".

BECCS is one of the primary CDR technologies used in climate scenarios, yet a study for the leading intergovernmental body on carbon sequestration reported that large-scale BECCS deployment would "necessitate planting bioenergy crops on […] approximately one-third of the arable land on the planet".

The IPCC report highlights concerns that raising expectations of "large-scale CDR deployment in the future can lead to an actual reduction of near-term mitigation efforts"; in effect building complacency that difficult decisions about short-term emissions reductions are not needed because of the future panacea of CDR.

Unreliable scenarios, underestimating risks

Investors are using scenarios to assess the risks they face from the energy transition, in line with the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD). At present, they are at risk of substantially underestimating those risks by relying on scenarios that fail to limit warming to 1.5°C and rely excessively on carbon capture and removal.

The scenario most widely used by investors is the International Energy Agency's (IEA) Sustainable Development Scenario (SDS), which the IEA claims is aligned with the Paris goals. However, analysis by Oil Change International has shown that the SDS can only be considered to be on track for 1.5°C - 1.8°C if it assumes the use of CDR technologies at levels considered unrealistic by both the IEA and the IPCC. In fact the SDS has the same emissions trajectory as the IEA's previous '450' scenario, which only gave a 50% chance of limiting warming to 2°C.

Oil and gas companies' scenarios also include highly questionable assumptions about these technologies. For example, Carbon Tracker found that Shell's 2°C scenario would require "some 10,000 large-scale carbon capture and storage facilities to be built over the timeframe (more than one every other day for the next 50 years)."

Such scenarios push the boundaries of plausibility and do not serve as a credible guide to alignment with the Paris goals.

Another report called *"How to waste over half a trillion dollars"*[10] published by the Carbon Tracker Initiative (CTI) in March 2020 conducts a similar analysis centred on the coal industry this time. The CTI report shows that *"there is currently 499 GW of coal capacity announced, permitted, pre-permitted and under-construction throughout the world with an overnight investment cost of $638 bn"* and, that, given the economics of the coal industry and the competition with renewable energy sources, the underlying coal assets run a high risk of being stranded and, as a consequence, the vast majority of the capital expenditures in the coal industry of being wasted. We will come back to this issue when we address the question of the calibration of the risk linked to fossil fuel exposures, but one conclusion we can draw from reading both the Global Witness and the CTI reports is that the link between expansion, global warming and wasted capital expenditure is similar for the oil and gas industry and for the coal industry.

Those reports set the scene for our own report that aims both at understanding the consequences for financial stability of the behaviour of banks making possible a seemingly ever-increasing fossil fuel production, and proposing concrete solutions to tackle the issue.

III. Climate change is made possible by finance and it will trigger a financial stability debacle: dynamics of the climate-finance doom loop

We are facing a situation where, regardless of whether we are dealing with oil, gas or coal, the fossil fuel industry is still on an expansionary path, which feeds global warming and spells future disaster, all at once for the planet, for human societies, for the global economy, for the financial system and for the fossil fuel industry itself. This, it has to be noticed, is unrelated to the simultaneous development of green energy sources. Today's world is characterised by the concomitant development of both green and brown energy sources and we have to be conscious that, even if obviously indispensable, developing green energy sources will not be sufficient to tackle the global warming problem. The world has to stop using, a fortiori expanding, brown energy sources (i.e. all fossil fuels) if it wants to avoid catastrophic global warming.

In the now growing community recognising this analysis, a debate has emerged to determine whether the most efficient way of stopping the exploitation and the expansion of the fossil fuel industry should consist of limiting the demand for fossil fuels (e.g. by regulating the fossil fuel industry differently, imposing carbon taxes, or a carbon price – with a price set at a sufficient level –, stopping subsidising fossil fuels…), or of reducing the supply side of the equation, with a particular emphasis on limiting the financing of fossil fuel companies. We are of the view that, far from being exclusive of one another, those two approaches should be developed in parallel, and that their objectives are complementary but different. Limiting the demand for fossil fuels through the use of various fiscal and economic-policy tools is an obvious avenue to explore, but it is not the theme of this report. Addressing the climate change-enabling dimension of the provision of finance to the fossil fuel industry and its consequences on financial stability is another thing, and it is the theme of this report.

But the debate does not end here. It is often heard in financial circles that putting the weight of fighting climate change on the shoulders of financial institutions and investors is unfair to them as they are only one among many categories of economic actors and they do not have the power to change society's economic behaviour. The key question, the argument goes, is to change their clients' behaviour (in this instance, fossil fuel companies), not theirs. This can be summarised by the "we finance the world as it is" argument.

10 Carbon Tracker Initiative: "How to waste over half a trillion dollars", March 2020

Two points need to be made about this argument:

1. It forgets conveniently the most essential dimension of financial activity: finance is that very special human activity that makes other human activities possible. This is why it has always been, and will always be, at the centre of economic life and why society cannot afford to see it fail or stop. Incidentally, extending credit, by definition a banks' prerogative, has an even more special status within the multi-faceted world of finance: credit represents the bulk (ca. 97%) of money creation[11] in modern societies, and by delegating that power to commercial banks (which is a choice not a given, as alternative ways of organising money creation would be possible), society has delegated to them an immense power, i.e. the power of making specific economic activities possible or not. This is why our approach to finance in general and, as far as this report is concerned, to bank credit, is to see finance as the enabler of the economy. This enabling role applies obviously to all sectors, and therefore to the fossil fuel sector. Contrary to what prevailing financial theory tells us, finance is not neutral: how much further from neutral can you get than making other human activities possible? To say the least, the "we finance the world as it is" argument is a very partial description of the reality of what banking activity stands for.
2. It misses the financial stability dimension and the fact that financial institutions bringing capital to fossil fuel companies act, as already pointed-out, as the enablers of climate change and thereby feed a situation that will backfire and destroy them. Climate change will have a destabilising effect on the financial system, and this is something that policy-makers and supervisors have a duty to stop given the indispensable role that finance plays in making possible the functioning of the economy. If finance, by enabling climate change through the financing of fossil fuel companies, makes possible a situation that will destroy economic activity and thereby destabilise the financial system, then the "we finance the world as it is" argument becomes, on top of being a partial description of reality, unacceptable. How could society accept to see develop and thrive an activity that will destroy it, and financial regulators a financial activity that will create financial instability?

A striking feature of the relationship between climate change and finance is the way they feed each other in the worst kind of doom loop: finance makes devastating climate change possible and climate change will devastate finance to the point of no return when the planet's carbon budget has been reached. Finance is the enabler of a phenomenon that will destroy it.

Going into more detail, the climate-finance doom loop can be described as a two-step process:

- **Step 1: Finance as the enabler of global warming**

  Finance in general and banking institutions in particular enable the acceleration of global warming: by bringing the capital needed for the functioning and the expansion of the fossil fuel industry (the $ 4.9 trillion that Global Witness refers to for oil and gas, and the $ 633 billion CTI refers to for coal), financial institutions make global warming possible.

  A number of different financial players are involved in the process but, among them, banks are of particular importance as pointed out in the report by Rain Forest Action Network *"Banking on Climate Change" – Fossil fuel report 2020"*[12]. The report investigates 35 large international banking institutions and shows that, over the four years since the Paris agreement (2016 – 2019), those banks have funnelled together $ 2.7 trillion of funding to the fossil fuel industry. This figure shows concretely the scale of the global warming enabling dimension of the banking industry: the world is warming because finance, and in particular bank-driven credit, enables it to warm. The problem for the financial industry, but one that it refuses to look in the eyes, is that by enabling the acceleration of global warming, it will create financial instability on a global scale. This phenomenon is described by the second step of the climate-finance doom loop.

11 Hence the well-known adage "Loans make deposits"

12 Rain Forest Action Network "Banking on Climate Change" – Fossil fuel report 2020

- **Step 2: Global warming as a cause of financial instability**

  Once the world has reached a level often described as the "tipping point", in other words when global warming reaches a level of 1.5°C and continues to rise towards a level comprised between 3.7°C and 4.8°C at the end of the 21st century according to the IPCC[13], climate change will backfire and destabilise the financial system.

  As now widely recognised by central bankers, climate change will trigger financial instability. In all likelihood, this instability will shake the financial system to its roots, if it does not destroy it. On top of the much-discussed physical risk, this will be due to the disrupting effects that climate change will have on the world economy. The Covid-19 crisis has illustrated the risk of the financial system collapsing because of an economic system coming unexpectedly to a virtual standstill. We will come back to this point in chapter 2.

Interestingly, the Guidelines on reporting climate-related information released by the European Commission in June 2019[14] give us the conceptual framework, in particular through their double materiality approach, to analyse the climate-finance doom loop: the financial system makes global warming possible as the enabler of fossil fuel exploration and production (inside-out extra-financial impact), and, as in a tale confronting two old enemies, the environment will strike back eventually and take the financial system down (outside-in financial impact).

In a double materiality approach, as defined in point 2.2 of the EC 2019 Guidelines on reporting climate-related information, the activity of banks enabling global warming has an impact on the outside world. Given the magnitude of the problem, there is also little discussion that this "inside-out" impact is to be considered as material, and that this materiality is both environmental and social given the consequences that global warming will have on populations, starting with climate change-related migrations of entire populations and their destabilising effects on human societies, to name but the most obvious one.

Interestingly, the number of banking institutions concerned is relatively limited (according to the Rain Forest Action Network "Banking on Climate Change – Fossil fuel report 2020", 35 banking institutions worldwide, among which 11 in the European Union), but their impact on the resilience of the entire financial system as the enablers of climate change is enormous.

The second phase of the climate-finance doom loop also fits perfectly in the framework provided by the EC 2019 *Guidelines on reporting climate-related information.* These guidelines incorporate the "outside-in" financial materiality approach developed by the *Task Force on Climate-related Financial Disclosure* (TCFD),[15] and they give a framework for describing what will happen when climate change starts exerting a destabilising effect on the financial system: financial instability will hurt banks' and financial institutions' accounts and, in all likelihood, threaten the very viability of many.

13 IPCC - Fifth Assessment Report, 2014

14 European Commission - *Guidelines on reporting climate-related information*, June 2019

15 Task Force on Climate-related Financial Disclosure

Chapter 2

What financial regulators and supervisors are doing... and not doing...

I. A broad recognition of the impact of climate change on financial stability

Central bankers, financial regulators and supervisors have made a remarkable journey towards recognising the importance of climate change and its impact on financial stability. In the course of a few years, the debate in the financial supervisory community has evolved from questioning the existence of a link between global warming and financial instability to quantifying it and discussing the measures that should be taken in order to turn this recognition into action.

In September 2015, Mark Carney, who was at the time the Governor of the Bank of England, gave a speech which he called *"Breaking the tragedy of the horizon"*.[16] This broadly acclaimed speech was a milestone in the recognition by central bankers and financial supervisors of the impact of climate change on financial stability, and an accelerator of their mobilisation on what was for them at the time an entirely new issue. Looking back, it was the start of a journey marked by many events, reports and discussions that led to today's consensus on the subject. Another important milestone was the creation of the Network for Greening the Financial System (NGFS)[17] in December 2017 by eight central banks, with a mission *"to help strengthening the global response required to meet the goals of the Paris agreement and to enhance the role of the financial system to manage risks and to mobilize capital for green and low-carbon investments in the broader context of environmentally sustainable development"*. The fact that, as of April 16th 2020, the number of members of the NGFS had grown to 65 plus 12 observers is a clear sign that the community of central bankers recognises without ambiguity the implications of climate change on financial stability.

Over the past years, a number of other important initiatives have been taken by European supervisors, such as the announcements of climate stress tests for banks and insurance companies by the Dutch National Bank, the Bank of England and the Banque de France, the launch of a sustainable finance action plan[18] by the European Banking Authority, and the creation of climate and sustainable finance commissions by national supervisors (e.g. Autorité de Contrôle Prudentiel and Autorité des Marchés Financiers in France), among others.

The context of these supervisory initiatives is obviously the considerable work done by the European Commission's High-Level Expert Group (HLEG) and Technical Expert Group (TEG)[19] on sustainable finance. The work done by the HLEG and the TEG does not deal with prudential regulation per se, but it has provided EU institutions with expert advice on building and implementing a credible sustainable finance action plan and establishing a number of principles aiming at shifting the EU's financial system in the direction of sustainability. This is obviously essential.

16 Mark Carney "*Breaking the tragedy of the horizon – climate change and financial stability*" speech - September 2015

17 NGFS

18 EBA Action plan on sustainable finance – December 2019

19 The author of this report chairs AMF's Climate and Sustainable Finance Commission, is a member of ACPR's Climate and Sustainable Finance Commission and a member of the European Commission's Technical Expert Group.

Under the leadership of the European Commission, the TEG produced a report[20] developing a so-called green Taxonomy, and that report gave rise to a subsequent Taxonomy regulation,[21] in the course of being adopted by the EU co-legislators at the time of writing this report. The EU green Taxonomy is the cornerstone of the EU sustainable finance strategy. Importantly, it must be understood that it is a classification of economic activities considered as sustainable and that it has an environmental performance objective but, conversely, that it is not a financial risk classification and that it does not have the objective of assessing the risks linked to sustainable, or unsustainable, activities. In other words, as important as it is, the EU Taxonomy is of no help for the subject we are dealing with in this report, i.e. the impact on financial stability of (by definition unsustainable) fossil fuel exploitation, exploration and production.

By contrast, financial stability is at the heart of the work done by the NGFS but, remarkably, the six recommendations made by its first comprehensive report published in April 2019[22] are exclusively centred on reporting, monitoring and measuring.

In May 2019, a month after the first report of the NGFS, Directive (EU) 2019/878 of the European Parliament and of the Council (CRD5) gave the European Banking Authority (EBA), in its Article 98 (8), a mandate to assess the inclusion of ESG risks in the supervisory review and evaluation process (SREP) and, most interestingly, Regulation (EU) 2019/876 of the European Parliament and of the Council (CRR2) stated in its Article 501c:

Article 501c CRR2

Prudential treatment of exposures related to environmental and/or social objectives

EBA, after consulting the ESRB, shall assess, on the basis of available data and the findings of the Commission High-Level Expert Group on Sustainable Finance, whether a dedicated prudential treatment of exposures related to assets or activities associated substantially with environmental and/or social objectives would be justified. In particular, EBA shall assess:

(a) methodologies for the assessment of the effective riskiness of exposures related to assets and activities associated substantially with environmental and/or social objectives compared to the riskiness of other exposure;

(b) the development of appropriate criteria for the assessment of physical risks and transition risks, including the risks related to the depreciation of assets due to regulatory changes;

(c) the potential effects of a dedicated prudential treatment of exposures related to assets and activities which are associated substantially with environmental and/or social objectives on financial stability and bank lending in the Union.

EBA shall submit a report on its findings to the European Parliament, to the Council and to the Commission by 28 June 2025.

On the basis of that report, the Commission shall, if appropriate, submit to the European Parliament and to the Council a legislative proposal.

If the objectives of Article 501c CRR2 can only be supported as the right ones, the concrete action plan deriving from them does not seem to denote the sense of urgency that the situation could command.

This point also comes out in the sustainable action plan issued by the EBA in December 2019, which follows a logic very similar to that followed by the report published by the NGFS in April 2019: both reports, beyond their announced good intentions, sound almost like an avowed willingness to delay decisions with the excuse of the time needed to assess such a complex problem.

20 Taxonomy: Final report of the Technical Expert Group on Sustainable Finance – March 2020

21 First reading position on the Taxonomy Regulation adopted by the Council on 15 April 2020

22 NGFS – April 2019: A call for action. Climate change as a source of financial risk

For instance, the wording of point 4.3 of EBA's sustainable finance action plan shows a great prudence towards conducting climate stress tests: 4.3 – 29 – *"there are multiple constraints on designing a robust framework"*, 30 – *"the exercise would focus on transitional risks and consider a longer time horizon"*, 31 – *"following this report the EBA might update relevant guidelines related to risk management and stress testing".*

The wording of point 4.4, which deals with prudential treatment, is not very different when it emphasises the *"complexity and potential impact of this work"*, to justify the distant deadline (June 2025) *"to assess if a dedicated prudential treatment of exposures related to assets or activities associated substantially with environmental and/or social objectives would be justified".*

EBA's report on the prudential treatment of exposures related to environmental and/or social objectives is due by 28 June 2025. This means that, even assuming that it recommends then to take concrete and meaningful action, no legislation deriving from this report can be in place before 2027 or 2028 for a start of application, perhaps, around the year 2030. The problem is that by 2030 the carbon budget of the planet will have been exhausted, and it is most likely that the climate-finance doom loop will have started to kick-in. In other words, in the context of urgency we are in, EBA's sustainable finance action plan will not make by itself the necessary difference.

II. Climate stress tests and their limitations

A number of initiatives have been taken by European supervisors to conduct climate stress tests of financial institutions (banks and insurance companies). Two types of methodologies have been considered for those stress tests:

- "top-down" analyses where supervisors estimate the sensitivity of banks' or insurance companies' balance sheets to various climate change scenarios. This logic is followed by De Nederlandsche Bank (DNB), the European Systemic Risk Board (ESRB), the European Banking Authority (EBA) and the European Insurance and Occupational Pensions Authority (EIOPA).
- "bottom-up" analyses where banking and insurance institutions make the estimations under the control of supervisors. This logic is followed by Bank of England (BoE) and Banque de France (BdF) and Autorité de Contrôle Prudentiel et de Résolution (ACPR).

In what has now become a traditional division, climate risk is usually thought of as the addition of two different components:

- Transition risk, i.e. the risk resulting from the implementation of public policies that could be adopted to mitigate climate risk, and more generally from a migration to a low carbon economy that would, by essence, impact the current economic system;
- Physical risk, corresponding to a higher frequency and severity of extreme climate events.

Strikingly, all European supervisors address the question of transition risk, even if with difficulty, but most skip the question of physical risk, with the exception of the Bank of England and Banque de France, but in the latter case only for the liability side of the balance sheet of insurers. This clearly reveals a high level of unease when it comes to evaluating the impact of climate risk on the financial system. Nobody will dispute the existence of transition risk and the interest we have to try to evaluate it, but simple intuition tells us that the impact of physical risk on financial stability will be of a bigger magnitude than transition risk. The fact that this bigger problem is precisely the dimension that most supervisors decide to ignore when they conduct their analyses does not bode well for the usefulness of the simulation exercises being conducted.

Bank of England and Banque de France will conduct their so-called climate stress tests (which, as we will see, are effectively scenario-based analyses and not stress tests) with a 30-year time horizon. How-

ever, a subtlety needs to be introduced at this point: one of the hypotheses of these exercises is that the simulation of the first 5 years will be conducted assuming that financial institutions keep a constant balance sheet, whereas the tests will assume dynamic balance sheets for the following 25 years. The dynamic balance sheet assumption will have important implications when we have to interpret the results of the tests, as it means concretely that the tests will assume that financial institutions have adapted to evolving conditions, e.g. for insurance companies raised premiums or stopped insuring what has become uninsurable, and for banks increased credit spreads or stopped financing the businesses that were no longer insured. This may well correspond to the reality awaiting us, but the realisation of such a scenario would mean that many businesses or human activities would stop being insured or financed and therefore would cease altogether. This, in turn, would trigger negative spirals in what economists call second round effects, and imply a general disruption of the economy and of the financial system.

In contrast with BoE and BdF, DNB conducted its 2018 so-called stress test exercise with a 5-year time horizon and it addressed only transition risk.

The different approaches taken by different European central banks show that the stress test exercises and scenario-based analyses conducted by the various central banks will lead not only to very different results, but also to results that will not be comparable with one another. This also means that those simulations will be of little practical value to understand the global situation given the irrelevance of national borders when it comes to assessing the impact of climate change on financial stability.

Disruption risk: the missing piece of climate stress tests

There is now a broad realisation, in particular after the work conducted by the IPCC, that climate change will bring a long list of plagues to the world. The environmental consequences of climate change (rising temperatures, droughts, rising sea levels, floods, hurricanes, pandemics…) will change the very geography of our planet and, subsequently, the world's geostrategic relationships. Among others, we will see massive migrations of populations linked to the fact that human life will have become unbearable, if not impossible, in growing parts of the world, and countries will fight for water and space.

In that context, it strikes us that the now traditional division of climate risk between transition risk and physical risk misses what is by far the biggest risk coming with climate change: disruption risk.

We define disruption risk as the fact that, in the light of the environmental and geostrategic upheavals that climate change will bring, there is no plausible scenario where the world economy as we know it will continue to function. In all likelihood, the economy will endure, at best, a considerable slowdown and, most probably, a prolonged depression because of climate change, its structures will be redesigned, and the financial system will be shaken to its roots, if not destroyed. In a nutshell, disruption risk is the fact that climate change will disrupt human societies, which will disrupt the world economy, which will disrupt the financial system. The occurrence of this risk is as certain as its quantification is impossible to realise. When the CEO of Axa said in 2015 that a world at + 4°C could not be insured,[23] he described disruption risk, i.e. not only a world where insurance companies will be out of business, but a world where economic activity as we know it today will have stopped functioning, as none of us knows how to run an economy without property and casualty insurance. As a reminder, the IPCC leaves little doubt that the world is on a + 4°C global warming path before the end of the century.

Interestingly, some publications[24] describe "disruption of business" as being part of "physical risk" but, to the best of our knowledge, beyond this conceptual recognition none of the climate-related simulations conducted by central banks take this risk into account. This may not be a surprise given the difficulty of the exercise, but it has implications on our ability to derive meaningful action plans from those simulations.

23 AXA, 2015: Climate change: it's no longer about whether, it's about when

24 See, for instance, IMF - Grippa, Schmittmann, and Suntheim, 2019 : Climate change and financial risk

We have just witnessed a situation where a pandemic-induced health crisis provoked a worldwide economic depression, which in turn brought chaos to financial markets, had a huge impact on financial asset prices, public budgets and the general level of indebtedness and, at the end of the chain, had the consequence of weakening the entire financial system. Clearly, the risk brought by the Covid-19 crisis was neither transition risk nor physical risk, at least in the generally accepted meaning of those expressions. It was disruption risk. Remarkably, the huge economic cost of the Covid-19 crisis happened despite the double characteristic of the virus of being highly contagious but of carrying a relatively low rate of lethality. In passing, it does not take a doomsayer to see that many of the plagues brought by climate change will spread as quickly as the Covid-19 virus but have every chance of being far more impactful.

Financial supervisors, as we have seen, approach climate stress tests through the exclusive lens of transition and, for some of them, physical risk. Notwithstanding the importance of climate change-related transition and physical risks, the ignorance of the biggest of all risks, disruption risk, raises yet more serious doubts about the ability of those stress tests to deliver sufficiently meaningful information to lead to action that can make a difference. This dimension is also ignored in the supervisory review and evaluation process (SREP), for instance, when Article 98 (8) of CRD5 dealing with the inclusion of ESG risks in the SREP gives to the EBA the mandate to *"assess the potential inclusion in the review and evaluation performed by competent authorities of environmental, social and governance risks (ESG risks)"*, which *"shall comprise at least the development of a uniform definition of ESG risks, including physical risks and transition risks"*. As is the case for climate stress tests, this ignorance limits significantly the ability of the supervisory review and evaluation process to lead to useful results on the question of the link between banking activity and climate change.

An important book, *The green swan*,[25] analysing *"Central banking and financial stability in the age of climate change"* came out in January 2020. *The green swan* first acknowledges that *"climate change is a source of financial (and price) instability"* and then describes most interestingly how *"climate change could therefore lead to "green swan" events and be the cause of the next systemic financial crisis. Climate-related physical and transition risks involve interacting, nonlinear and fundamentally unpredictable environmental, social, economic and geopolitical dynamics that are irreversibly transformed by the growing concentration of greenhouse gases in the atmosphere."* In our view, the key words in this description of the link between climate change and financial stability are "unpredictable" and "nonlinear". This description is similar to what we are describing in this report under the expression "disruption risk", and, strikingly for a book published under the auspices of the Bank for International Settlements and the Banque de France and counting several central bankers among its authors, the book recognises that *"integrating climate-related risk analysis into financial stability monitoring and prudential supervision is particularly challenging" and that "scenario-based analysis is only a partial solution to apprehend the risks posed by climate change for financial stability. The deep uncertainties involved and the necessary structural transformation of our global socioeconomic system are such that no single model or scenario can provide a full picture of the potential macroeconomic, sectoral and firm-level impacts caused by climate change. Even more fundamentally, climate-related risks will remain largely unhedgeable as long as system-wide action is not undertaken."*

We agree with the authors of *The green swan*: any modelling of the financial consequences of climate change, including so-called climate stress tests, has limitations to the extent that the very relevance of the exercise can be questioned, at least when it comes to using it as a tool for taking action to tackle the threat to financial stability that climate change presents.

25 BIS, BdF - Bolton, Despres, Pereira da Silva, Samama, Svartzman *The green swan* - 2020

III. Forget about stress tests, long live scenario-based analyses

If the ignorance of disruption risk were not enough to cast doubt on the ability of climate stress tests to make a difference, the very concept of climate stress tests is now widely recognised by supervisors as an expression used for communications purposes but not as an accurate description of the exercises they are undertaking.

It has been interesting to hear central banks and supervisors announce with great publicity that they would be stress-testing banks and insurance companies for climate risk before specifying soon after, and usually with more discretion, that the exercise would not consist in a stress test – defined as measuring the impact of climate change on the financial institutions' balance sheet and activity –, but as a scenario-based analysis consisting in understanding the transition risk, and sometimes the physical risk, incurred by financial institutions under different scenarios. For instance, the Bank of England will work in its 2021 exercise on three different scenarios with a 30-year time-horizon, going from a scenario where public authorities take immediately the additional measures necessary to stop GHG emissions, a second scenario where those measures are taken later and a third scenario where no additional measures to tackle climate change are taken. Following a rather similar logic, the Banque de France will also consider different scenarios and will try to understand essentially their impact on the transition risk incurred by financial institutions over the coming 30 years. In 2018, De Nederlandsche Bank took into account four different scenarios dubbed respectively "technology shock", "confidence shock", "double shock" and "policy shock" and conducted its 5-year scenario analysis to try to understand their impact on financial institutions.

Those exercises have a number of points in common:

- They try to understand the impact of different scenarios on the transition risk incurred by financial institutions;
- They are built on state-of-the-art econometric modelling but rely on fragile economic and technical assumptions (e.g. carbon price, economic growth, interest rate curves, impact on prices of financial assets…);
- They are mainly focused on transition risk;
- They address at the margin, when they do, the question of physical risk;
- They ignore the existence of disruption risk;
- They do not address the question of the impact of climate change on the solvency of financial institutions.

In other words those exercises are not stress tests.

The rationale behind the decision to shift away from stress test exercises to scenario-based analyses is the extraordinary difficulty to conduct the former. Central bankers and supervisors are indeed right to consider that quantifying the impact of climate change on the financial system with any degree of precision is, at best, extraordinarily difficult.

However, we consider that it is a paradox for central bankers and supervisors to recognize the difficulty, not to say the impossibility, of the exercise and to insist at the same time on the necessity to measure the financial impact of climate change before action can be taken. In a context where transition risk, the lesser of the climate change-related risks, is hardly starting to be considered (and with diverging methodologies), where physical risk (more significant than transition risk) is mostly out of scope, and the risk of disruption of the general economy (by far the biggest risk) is not even considered, asking to be able to measure precisely before taking action is synonymous with calling for inaction. In that respect, the survey on current initiatives related to climate-related financial risks published by the Bank for In-

ternational Settlements on 30 April 2020[26] confirmed our impression of a paradoxical combination of a growing awareness among the global central banking community of the impact that climate change will have on financial stability, and of a low ability of that community to swiftly take the measures that could make a difference.

We recognise that the positions that have emerged over the past five years on climate change and its impact on the financial system in the community of central bankers, regulators and supervisors represent significant progress. We are also familiar with the momentum of regulators' and supervisors' modus operandi, which by nature counts in years from idea to implementation. If we are therefore not surprised that, despite their recognition of the issue and of its urgency, central banks and supervisors are taking a slow route, we do not take comfort from hearing fire fighters say that they will start intervening only after they have a precise assessment of the damage that will be made by the fire.

The scenario-based analyses conducted by supervisors are interesting but they will be of secondary importance when it comes to taking action. As the Deputy General Manager of the Bank for International Settlements, Luiz Awazu Pereira da Silva, explained in May 2020 in a remarkable speech, *"Green Swans call less for improvements in risk modelling and more for decisive and immediate action and coordination"*.[27] Moreover, the results of those analyses will come only very gradually over the years in a context where we do not have the luxury of being able to wait.

Finance Watch fully supports the different pieces of action undertaken by regulators, supervisors and central banks: they should be pursued and amplified, as they contribute to a formidable and indispensable effort to address the threat to financial stability posed by climate change. However, this effort will not be sufficient on its own and policy-makers and legislators must start taking the measures that will make a difference, without falling under the illusion that the situation is under control because supervisors and central banks have started to act. The situation is not under control.

26 BCBS - *Climate-related financial risks: a survey on current initiatives*, April 2020

27 Green Swan 2 – *Climate change and Covid-19: reflections on efficiency versus resilience*

Chapter 3

Prudential regulation as a tool to tackle climate-related financial instability

I. Regulation as the only way to promote the public interest

Acting requires first and foremost knowing the direction of travel. This direction is unfortunately clear today: the acceleration of global warming made possible by financial institutions will lead to catastrophic consequences for human societies, for the economy and for financial stability. Having assessed the direction of travel, the question becomes to determine what tool should be used to tackle, or at least mitigate, the issue.

Increasing the transparency and the quality of extra-financial information is often presented as the right tool to mitigate the impact of economic systems on the environment. The rationale of this approach is that adding transparency and improving the quality of information will enable financiers to take informed decisions and thereby improve market behaviour on ESG issues and, as far as the subject of this report is concerned, on climate-related issues. In the end, better information on ESG, and on climate-related issues in particular, is meant to become the driving force behind the reorientation of capital towards a sustainable economy. This logic underlies the sustainable finance initiatives, whether voluntary or regulatory, that have emerged over the past few years, the most prominent ones being the Task Force on Climate-related Financial Disclosure (TCFD) with its single materiality outside-in financial impact logic, and the European Union's sustainable finance agenda and its many pillars (Disclosure, Benchmark, Taxonomy, NFRD, Green label, Green Bonds Standards...) with its double materiality logic combining outside-in financial impact and inside-out extra-financial impact.

If we believe that markets and private forces, provided they are given the right information, can make the right decisions on questions of public interest, increasing transparency and the quality of information is the right approach. This is a big "if". We would argue that, if there is a rationale for thinking that market forces are indeed able to take into account the impact of climate change on companies' accounts (outside-in financial impact) provided they are given the right information, it is doubtful that they will modify their behaviour impacting their socio-environment (inside-out extra-financial impact) on the only basis of an increased quality and quantity of extra-financial information. This, of course, is not to say that the double materiality approach taken by the EU is not the right one (we are convinced that it is the only approach to non-financial reporting that makes sense), this is only to say that increasing the transparency and the quality of extra-financial information is a necessary but not a sufficient condition for private actors to integrate fully the impact of the behaviour of businesses on their socio-environment. The reason for this is easy to fathom: outside-in financial impact is a question of private interest, whilst inside-out extra-financial impact is a question of public interest.

Adam Smith addressed the public interest / private interest issue at the end of the 18th century when he analysed the fact that, whilst private interests are the engine driving the provision of economic goods to society (the invisible hand), it is not in the nature of private agents to consider public interest nor to self-regulate.[28]

28 Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Book I, conclusion of chapter XI: *"The interest of the dealers, however, in any particular branch of trade or manufactures, is always in some respects different from, and even opposite to, that of the public. To widen the market and to narrow the competition, is always the interest of the dealers. To widen the market may frequently be agreeable enough to the interest of the public; but to narrow the competition must always be [...]*

The current momentum in favour of sustainable finance could almost make us believe that Adam Smith's logic has found its limits: the narrative behind the efforts to promote sustainable finance, whether in its soft law or in its hard law versions, can often be boiled down to a logic of increased transparency and better extra-financial information supposed to lead private actors towards making decisions that will benefit the public interest. The efforts of the sustainable finance community are focused today on analysing what sustainability means, and how a better defined sustainability can be detected and taken into account by investors and bankers and, thereby, exert a positive influence on the world. This trend is positive and must be pursued, but this approach is not sufficient. In a world of global warming and depleted biodiversity, detecting sustainable activities with a view to allocating capital to them is in the obvious interest of financiers: given the importance of the topic, so-called green assets will, in all likelihood, derive good profit margins over the coming decades and therefore face no difficulty attracting the capital they need to develop. One could argue that Adam Smith's invisible hand seems to be at work, as the oft-encountered expression of "doing well by doing good" seems to be telling us. But this is only part of the story: the reality of sustainable finance today is that it does not allocate capital to a sustainable economy but to the already sustainable fraction of the economy, or to the fraction of the economy on its way to becoming sustainable. The difference is enormous.

Adam Smith's lesson that it is not in the nature of dealers to look after the public good is well illustrated by the way bankers and investors allocate capital both to sustainable activities and to activities that contribute to destroying the planet. Many large banks and financial institutions combine a real effort in favour of sustainable finance and are, simultaneously, the biggest financiers not only of fossil fuel companies but also of the fossil fuel industry expansion. The largest asset managers of the planet claim a willingness to build socially responsible investment portfolios or align their portfolios with the Paris agreement, but they are massively invested in an economic world on its way to + 4°C global warming by the end of the century. In other words, most large financial institutions are both the promoters of green finance and the providers of capital to the brownest parts of our economy. They "finance the world as it is" and, confronted with two profitable projects, one green and one brown, they provide capital to both projects, regardless of their respective colour. For all the benefits it brings, improving the quality and the quantity of extra-financial information provided to investors and bankers will not change this behaviour. Only a change in the rules of the game, i.e. a change of regulation, can achieve this objective.

II. Prudential regulation as a tool to combat climate-related financial instability

The only way to make private financial institutions take into account the public interest is for public authorities to edict rules that will force private actors to change their behaviour. We argue in the rest of this paper that banking prudential regulation has the power to curb the financial flows enabling the acceleration of climate change and therefore climate change-related financial instability. We also show concretely what steps should be taken to reach this objective. This, in passing, is not conceptually different from what is happening in other domains where financial regulation is used to prevent financial activities that society considers undesirable, as is for instance the case for money laundering and the financing of terrorism. Importantly, history has shown over and again that private interests may lobby in order to have rules written in their favour, but also that once rules have been adopted, they adapt to them regardless of whether the rules were thought to be desirable or not in the first place.

[...] against it, and can serve only to enable the dealers, by raising their profits above what they naturally would be, to levy, for their own benefit, an absurd tax upon the rest of their fellow-citizens. The proposal of any new law or regulation of commerce which comes from this order ought always to be listened to with great precaution, and ought never to be adopted till after having been long and carefully examined, not only with the most scrupulous, but with the most suspicious attention. It comes from an order of men whose interest is never exactly the same with that of the public, who have generally an interest to deceive and even to oppress the public, and who accordingly have, upon many occasions, both deceived and oppressed it."

Box 3 – Integrating Climate-related Risks into Bank's Capital Requirements
I4CE report

A recent report by climate economics think tank I4CE,[29] describes two possible approaches, and therefore justifications, for calibrating banks' capital requirements to the exposures of banks to brown, or possibly to green, assets and thereby for exerting an influence on the climate issue:

- A risk-based approach aiming both at reinforcing the resilience of banks to climate risks and guaranteeing financial stability;
- An economic policy approach aiming at using capital requirements to orient capital flows towards financing a low-carbon economy and/or away from financing a high-carbon economy.

I4CE comes to the conclusion that the risk-based approach cannot lead anywhere given the difficulty, not to say the impossibility, of precisely measuring the impact that climate change will have on individual institutions, whilst the economic policy approach can be justified but leaves open the difficult debate of knowing whether prudential regulation should be used as a tool to conduct economic policy.

Whilst we share the view of I4CE on the impossibility of measuring with any degree of precision the impact of climate change on individual institutions, we think that determining the capital requirements to apply to fossil fuel exposures does not necessitate a precise and illusory measurement of the risk taken, but simply to ensure that it is coherent with the Capital Requirements Regulation (CRR) that does the same exercise for many different types of exposures for which no higher degree of precision of risk measurement can be claimed. We will show in the next chapter that this is what Article 128 CRR does when it deals with "Items associated with particular high risk". We therefore think differently from I4CE when it states that calibrating a risk weight recognizing the risky nature of fossil fuel exposure is a "logical dead-end": far from being a "logical dead-end",[30] we believe that it can and must be calibrated in a manner that will make it consistent with the broader Capital Requirements Regulation in a context where measuring risk on any asset class is never an exact science. The real issue is one of coherence of prudential regulation and of the measures applied across asset classes. As for I4CE's recommendation to turn to bank climate stress tests as a solution, we have explained extensively in chapter 2 why and how the stress tests conducted by (a limited number of) central banks will lead to no significant result and will not be the occasion for policy-makers to take action.

I4CE has a point when it emphasises the difficulty of using prudential regulation as an economic policy tool. But using it as an economic policy tool is one thing and using it as a tool to combat financial instability at a macro level is an entirely different story. In our view, this latter objective should not be up for discussion, as combating financial instability is the very purpose of macro-prudential regulation. This, incidentally, is the logic of Article 501c CRR2 adopted in May 2019 that we described in the previous chapter, and it raises a fundamental question: if macro-prudential policy does not address the issue of financial stability, what piece of regulation will?

Finally, I4CE argues that *"the solution probably lies in a decentralised system that leaves it up to each bank to set up an instrument adapted to its loan portfolio and the nature of its activity, with supervisors simply providing a general framework to be respected, setting a course and monitoring the banks' progress"*. Regardless of the merits of a number of private initiatives in this domain, we argue that such an approach has no chance of ever tackling the climate-finance doom loop and preventing the financial instability that will derive from climate change. Not only, as described by Adam Smith, is it not in the nature of private actors to look after the public interest, but, more importantly even, tackling financial instability is a question that should be addressed by macro-prudential regulation and can in no way be left to self-regulation or to the good will of institutions that are, by construction, judge and jury to the question. This would be asking from them more than they can give.

29 IC4C – *Integrating Climate-related Risks into Bank's capital requirements* – March 2020

30 I4CE – Op Ed by Michel Cardona – *Banks' capital requirements for the climate: Let's ask the right questions*

III. A three-step logic to the action EU policy-makers must take

The EU legal and regulatory toolbox provides a coherent and complete environment to tackle the climate-finance doom loop. From the establishment of fundamental principles, to the conceptual framework, to the implementation of the measures that will make a difference, all the necessary tools exist and are ready to use.

1. Article 191 of the Treaty on the Functioning of the European Union and the obligation to act

EU policy-makers have first to ask themselves whether they have the possibility, or the obligation, to act. The answer to this question is given without ambiguity by the precautionary principle detailed in Article 191 of the Treaty on the Functioning of the European Union (TFEU).[31] This principle aims at ensuring a higher level of environmental protection through preventive decision taking in the case of risk.

With its explicit objectives of preserving the environment, of protecting human health and *"in particular combating climate change"*, and with its statement that *"Union policy on the environment (…) shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay"*, Article 191 TFEU seems to have been written for the situation we have to address. Importantly, it assigns an obligation to EU policy-makers to both take preventive action in the case of risk (precautionary principle) and combat climate change.

Having analysed and set out in the first two chapters of this report that not only urgent action is needed to tackle the climate-finance doom loop, but also that the regulatory and supervisory initiatives being currently rolled-out in the EU (from sustainable finance regulation to so-called climate stress tests) will not make the necessary difference, Article 191 TFEU creates the unambiguous obligation for EU policy-makers to act: not acting preventively in the face of risk and not combatting climate change would constitute a violation of the Treaty.

2. EC 2019 Guidelines on reporting climate-related information as a conceptual framework

The *Guidelines on reporting climate-related information* released by the European Commission in June 2019 give us the framework, in particular through the double materiality approach, to analyse the climate-finance doom loop.

As previously described, the logic of double materiality is to consider both the impact of enterprises on their socio-environment and on climate change (inside-out / environmental and social materiality) and of the socio-environment and climate change on enterprises (outside-in / financial materiality). In both cases, and with a view of being pragmatic, only substantial impact is considered. The double materiality logic taken by the EU contrasts with the approach developed by the *Task Force on Climate-related Financial Disclosure* (TCFD) where only outside-in materiality is considered.

Importantly, the 2019 EC *Guidelines on reporting climate-related information* also make clear that a long term perspective should be considered when it comes to assessing the impact of climate risk (page 7): *"When assessing the materiality of climate-related information, companies should consider a longer-term time horizon than is traditionally the case for financial information. Companies are advised not to prematurely conclude that climate is not a material issue just because some climate-related risks are perceived to be long-term in nature. When assessing the materiality of climate-related information, companies should consider their whole value chain, both upstream in the supply-chain and downstream."*

31 Article 191 of the Treaty on the Functioning of the European Union

The climate-finance doom loop fits perfectly in the framework provided by the double materiality concept:

- Inside-out / environmental and social materiality: the behaviour of banks financing the exploration and the production of new fossil fuel resources has a direct impact on climate change, as those banks are vectors enabling the acceleration of global warming. By making possible the expansion of GHG emissions, they are the enablers of the acceleration of global warming. In a double materiality approach, as defined in point 2.2 of the EC 2019 *Guidelines on reporting climate-related information*, those companies' activities have an impact on the outside world. Given the magnitude of the problem, there is also little doubt that this impact is to be considered as material, and this materiality is environmental as well as social, given the consequences that global warming will have on populations, starting with climate change related migrations and their destabilising effects on human societies, to name but the most obvious one.
- Outside-in / financial materiality: when climate change starts exerting a destabilising effect on the financial system "beyond the tipping point", it will hurt its accounts, its balance sheets and its very viability. Here again, and despite the impossibility described in chapter 2 to quantify it today with any reasonable degree of precision, there is little discussion about the magnitude of the financial impact that climate change will exert on the financial system. Transition risk and physical risk will undoubtedly take their toll on the financial system and, most importantly, the disruption of the functioning of human societies brought by climate change will impact economic activity and vast parts of the financial system, if not its entirety. This dimension is what both the TCFD and the EC 2019 *Guidelines* aim to assess and recommend to report in their approach of financial materiality.

3. Adapting prudential regulation to combat the climate-finance doom loop

Having established the legitimacy and the necessity of using prudential regulation as a tool to tackle the climate-finance doom loop, we now need to link the obligation to act stated by Article 191 of the *Treaty on the Functioning of the European Union*, and the double materiality conceptual framework established by the *Guidelines on reporting climate-related information* to prudential regulation. This needs to be done at a very granular level in order to develop the tools necessary to make a difference.

We will conduct this exercise by combining a dual micro-prudential / macro-prudential approach. The reason for doing so is linked to the double materiality approach to which we adhere:

- The micro-prudential approach is justified by the fact that financial materiality is micro-prudential given that it looks at the impact of a given state of nature (global warming) on the resilience of specific financial institutions;
- The macro-prudential approach is justified by the fact that environmental and social materiality has a macro-prudential nature given that it deals with the impact of credit institutions on the outside world as the enablers of global warming and, as a consequence, the enablers of financial instability.

In summary, in a context where the precautionary principle included in the *Treaty on the functioning of the European Union* leaves no option to policy-makers not to address the climate-finance doom loop, and where the EC 2019 *Guidelines on reporting climate-related information* give the framework to report it, European policy-makers have a duty to amend both micro-prudential and macro-prudential regulation to address the issue.

Chapter 4

Thinking economically about breaking the climate-finance doom loop

I. Identifying banking practices enabling the acceleration of climate change

If the first (inside-out) leg of the climate-finance doom loop is of a macro-prudential nature and its second (outside-in) leg of a micro-prudential nature, the fact that financial institutions, and in particular banking institutions, are the enablers of a phenomenon that will end-up destabilising the financial system makes macro-prudential regulation central to tackling the problem.

The banking prudential regulatory toolkit offers a number of different options to manage macro-prudential risks. Some of them can be applied to all banking institutions (this is, for instance, the case when macro-prudential rules are applied to the mortgage market in the face of real estate bubbles), and some are institutions specific, placing restrictions on targeted activities of identified financial institutions.

We think that the prudential measures to take in order to address the climate-finance doom loop should target only the institutions identified as acting as enablers of the acceleration of climate change, as opposed to imposing conditions or additional capital buffers to all banking institutions in an indiscriminate manner. This is a condition both for the measures related to the first leg (inside-out) of the climate-finance doom loop to be effective in tackling the financial instability that will derive from the activities of the institutions effectively providing financing to the fossil fuel industry, and for the measures related to the second leg (outside-in) of the climate-finance doom loop to reflect the risks taken by those specific institutions through their fossil fuel exposures. Conversely, while the effects of climate change on all banks will be increasingly relevant, targeting all banking institutions indiscriminately under the proposal made in this report would be counter-productive, as it would neither address the question of the global warming-enabling function of the banks financing fossil fuel exploitation, exploration and production, nor recognise the behaviour of the banks that have decided not to act as such enablers. This last point is particularly important, as the objective is obviously to see a growing portion of banking institutions join the latter camp.

II. Making a distinction between existing and new fossil fuel reserves

The prudential regulation recommendations we make in this report establish a distinction between the exploitation of existing fossil fuel resources on the one hand, and the exploration, production and exploitation of new resources on the other hand.

From an operational standpoint, three reasons push us to establish this distinction:

- The world still needs a transition period during which fossil fuels will continue to be used;
- Such a transition period must, by definition, be limited in time. This means, among others, that replacing fossil fuels reserves as they are consumed is not compatible with the notion of transition period: if reserves are replaced, the transition period will, by definition, never end and it should therefore not be dubbed transitory;
- Exploring and exploiting more fossil fuel reserves to add to already existing ones is even worse than replacing them, as it means increasing the pace at which fossil fuels are burned and CO2 released in the atmosphere, and therefore the pace at which man-made activity accelerates global warming.

Put simply, if existing fossil fuel reserves are replaced or increased as they are burned, the world will never reach its zero C02 emission target.

As importantly, the distinction we introduce between exploiting existing reserves and exploring new ones is linked to the fact that the financial risks related to the two activities can be differentiated:

- Exploiting existing reserves creates a financial risk related to the fact that the fossil fuel assets exploited run a significant risk of becoming at least partially stranded during their lifetime;
- Exploring for new reserves and exploiting them creates two financial risks: 1) it accelerates global warming and subsequently feeds the financial instability that will accompany it; 2) the newly discovered fossil fuel assets will, with quasi-certainty, become entirely stranded during their lifetime.

Applying different capital requirements to banks for those respective activities has therefore different rationales: the rationale for applying specific capital requirements to existing fossil fuel exposures is risk-based, and is linked to a risk considered as significant for existing reserves to become at least partially stranded during their lifetime; in contrast, the rationale for applying different specific capital requirements for the exposures of banks linked to new fossil fuel exploration, production and exploitation is both risk-based, but with an appreciation of risk with a much higher probability and severity than in the case of already exploited reserves, and policy-based, with the objective of taming the climate change enabling dimension of banking activity and the financial instability that will accompany it.

The "stranded assets" concept first developed by the Carbon Tracker Initiative is essential in this debate. Since its introduction by the seminal *"Unburnable Carbon 2013: Wasted capital and stranded assets"* report,[32] the concept has been researched extensively and commented by analysts, think tanks, academia and supervisors, and the strength of its logic has imposed itself as an unavoidable reference. The distinction we make above between a "significant risk of becoming at least partially stranded" for existing reserves and a "quasi-certainty of becoming entirely stranded" for newly explored reserves is inspired by this logic. It is also fed, among others, by the reports published in 2019 by Global Witness and in 2020 by Carbon Tracker Initiative and describing how $4.9 trillion and $638 billion will be wasted respectively by the oil and gas industry and by the coal industry over the coming decade in their quest for expanding their business (cf. chapter 1).

Box 4 – Stranded assets

Extract from the Carbon Tracker Initiative website[33]

"At its simplest, the stranded assets debate goes as follows: if mankind wants to give itself a chance not to exhaust the earth's carbon budget and limit global warming, it will have to leave a significant proportion of its fossil fuel reserves under the ground, in which case the enterprise value of fossil fuel companies will diminish accordingly. Alternatively, if oil and gas companies' activity and expansion continue unabated, global warming will make the global economy and the financial system collapse, and the value of fossil fuel companies and fossil fuel related financial instruments, like all financial assets, with them."

The strength of the stranded assets narrative is that, indisputable as it is, the discussions around our ability to measure the precise impact of global warming to take action become pointless. When financial institutions provide capital to fossil fuel facilities, exploration and production, they incur the risk linked to the unavoidable decline of the value of fossil fuel enterprises, either because fossil fuel reserves will stop being exploited in an attempt not to exhaust the planet's carbon budget, or because their continued exploitation will take the planet beyond the global warming tipping point and thus trigger a global economic and financial meltdown. In both scenarios, the financial value of fossil fuel reserves and com-

32 *Unburnable Carbon 2013: Wasted capital and stranded assets*

33 Carbone Tracker Initiative website

panies will collapse and the implications for banks, insurance companies, pension funds and investors exposed to those assets will be considerable.

III. Fixing a risk weight for existing fossil fuel exposures

EU bank capital requirements are calibrated in the Capital Requirements Regulation (CRR).[34] This regulation was adopted in 2013 and reformed in 2019 by CRR2.[35] It is founded on a risk-based approach.

Article 128 of CRR2 deals with *"Items associated with particular high risk"* and replaces paragraphs 1 and 2 of CRR. It states that:

> *"1. Institutions shall assign a 150 % risk weight to exposures that are associated with particularly high risks.*
>
> *2. For the purposes of this Article, institutions shall treat any of the following exposures as exposures associated with particularly high risks:*
>
> - *(a) investments in venture capital firms, except where those investments are treated in accordance with Article 132;*[36]
> - *(b) investments in private equity, except where those investments are treated in accordance with Article 132;*
> - *(c) speculative immovable property financing.";*

Paragraph 3 of Article 128 of CRR (not replaced by CRR2) then affirms:

> *"3. When assessing whether an exposure other than exposures referred to in the paragraph 2 is associated with particularly high risks, institutions shall take into account the following risk characteristics:*
>
> *(a) there is a high risk of loss as a result of a default of the obligor;*
>
> *(b) it is impossible to assess adequately whether the exposure falls under point (a).*
>
> *EBA shall issue guidelines specifying which types of exposures are associated with particularly high risk and under which circumstances.*
>
> *Those guidelines shall be adopted in accordance with Article 16 of Regulation (EU) No 1093/2010."*

The "high risk" definition of Article 128-3 of CRR seems to have been written to deal with the stranded assets situation:

- In a context where regardless of the scenario, the value of fossil fuel enterprises is doomed, the probability of default of the obligor, and therefore the risk of loss of the banking institution, is obviously high (3 (a)).
- Moreover, assessing adequately the magnitude of the risk of realisation of stranded assets (magnitude and timing) is impossible given that we are dealing with an entirely new situation rendering historical data of no use to predict future cash flows, future values or coming economic performance. Only the direction of travel is known, and it is downwards (3 (b)).

34 Regulation (EU) no 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending regulation (EU) no 648/2012

35 Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 may 2019 amending regulation (EU) no 575/2013 as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and regulation (EU) no 648/2012

36 Article 132 deals with exposures in the form of units or shares in CIUs (Collective Investment Units), which receive a 100% risk weight. It is therefore not relevant for the situation we are investigating here.

Applying Article 128 of CRR in a stranded assets context, it seems as though the regulation already in place is calling out for the imposition of a 150% risk weight to exposures taken on existing operations of fossil fuel companies.

It is to be noted that Article 128 of CRR also imposes a 150% risk weight, among others, to credit extended to speculative immovable property financing and to investment in private equity. From a financial stability standpoint, it would be difficult to argue, in a context of looming stranded assets, that the fossil fuel industry is less risky than private equity in general or than immovable property. Regardless of the scenario contemplated, the cash flows of oil and gas companies will be negatively impacted and highly volatile and there can be no justification not to apply Article 128 of CRR and therefore not to impose a 150% risk weight to existing fossil fuel exposures. Applying a 100% risk weight to fossil fuel exposures, as is the case today, can only be seen as an incentive for the financing of fossil fuel operations given that it does not reflect the level of risk incurred in a stranded asset context. The current 100% risk weight acts as an incentive to exploit and replace fossil fuel reserves and is a clear signal for the banking and the fossil fuel industry not to change the course of things. As such, the 100% risk weight seems to breach the precautionary principle introduced by Article 191 TFEU. Incidentally, whilst stopping the positive signalling effect, a 150% risk weight would allow in the short term the continued financing of existing fossil fuel operations and would not trigger any brutal interruption.

Obviously, the 150% risk weight for existing fossil fuel operations exposures should also constitute a floor for credit institutions using the internal model approach to calculate their risk-weighted assets.

IV. Fixing a risk weight for new fossil fuel exposures

We have explained extensively in this report the reasons why continuing to extract more oil, more gas and more coal will accelerate the race toward a level of global warming that will topple the economy and the financial system. This is why we consider this issue, before anything else, as a macro-prudential risk, why we assume the fact that prudential regulation can and should be used in such cases as a tool to orient capital flows, and why we have acquired the conviction that the level of risk weight to be applied to such exposures can be chosen qualitatively, i.e. as a matter of principle, as opposed to after a quantitative assessment of the actual risk incurred (an impossible exercise under the circumstances anyhow, as we have already explained).

We therefore propose a simple principle to treat exposures to new fossil fuel activities or exploration: the risk applied should lead banking institutions to finance fully through equity the credit they provide in this case.

The reason for this proposal is justified by our two-pronged approach: from a financial stability standpoint, the objective is to discourage the financing of global warming-accelerating activities for the reason that they feed financial instability; from a risk-based approach, the objective is to account for the near certainty that reserves that are being explored today and will start to be exploited in the future will become stranded before the end of their normal exploitation cycle.

Calibrating the capital requirements that will achieve this double objective is both a function of what makes economic sense and of the existing CRR logic.

Article 92 of CRR establishes the following minimum capital requirements for banks (all ratios being calculated as a percentage of risk-weighted assets[37]). Implicitly, it gives us the key to calculate the risk weight to apply to exposures that need to be entirely equity-funded:

37 Bank assets weighted for risk for the purpose of calculating capital adequacy under the Basel framework.

Article 92

Own funds requirements

1. Subject to Articles 93 and 94, institutions shall at all times satisfy the following own funds requirements:

- *(a) a Common Equity Tier 1 capital ratio of 4,5 %;*
- *(b) a Tier 1 capital ratio of 6 %;*
- *(c) a total capital ratio of 8 %.*

Imposing that the funding of new fossil fuel exploration be financed 100% with capital would require banking institutions to set the risk weight on exposures to new fossil fuel exploration, production and exploitation at:

$$100\% / 8\% = 1250\%$$

Under this proposal, the risk weight applied to the financing of new fossil fuel exploration, production and exploitation (including, obviously, the construction and the exploitation of new fossil fuel power plants) exposures would therefore be 1250% under the standardised approach. Simultaneously, and for obvious reasons, internal models should take this level as a floor for those activities given the macro-prudential logic of the proposal (internal models take, by construction, a micro approach).

Applying a risk weight of 1250% on banks' exposures to new fossil fuel exploration, production and exploitation would mean that these activities would be exclusively equity-funded, which would have the consequence that they would not benefit from the leverage effect usually associated with bank lending. When providing finance for new fossil fuel exploration, production and exploitation, banks would operate like non-leveraged bond funds, i.e. allocate debt finance from equity they have raised previously rather than create money through their lending activity.

It is to be noted that imposing a risk weight of 1250% leading to complete equity financing of an activity is not foreign to the logic of CRR: it is, for instance, the case for the purpose of calculating the capital requirements of holding companies as defined in its Article 89.

Understanding the risk and the volatility of the revenues linked to fossil fuel investment is of paramount importance. If exposures of financial institutions to existing fossil fuel activities are already very risky, thereby justifying a 150% risk weight as required by Article 128 of CRR, the work done by Carbon Tracker Initiative, for instance in its already mentioned *"How to waste over half a trillion dollars"* report, shows clearly that exposures to new fossil fuel activities are doomed to lead to a complete loss of the capital invested. This, in our view, takes us to the logical conclusion that a risk weight of 1250%, implying pure equity financing, is the only one that can make any sense from a micro-prudential risk-based standpoint. This is notwithstanding the macro-prudential considerations developed above.

All in all, we argue that the simultaneous imposition of a 150% risk weight on exposures related to the exploitation of existing fossil fuel reserves combined with a 1250% risk weight on exposures related to new fossil fuel exploration, production and exploitation would go a long way towards reaching the three objectives that we have defined for policy-makers: 1) putting a halt to the acceleration of the race towards financial instability that will come with global warming, 2) not encouraging the business as usual scenario made possible by the replacement of existing reserves, and 3) accounting for the stranded asset risk now widely recognised on existing fossil fuel reserves and that will be even more important on the reserves that will be discovered and exploited tomorrow. The CRR was written to put these measures in place but, as we will see in the next chapter, they are not yet being used.

Chapter 5

What regulatory tools to tackle the climate-finance doom loop?

Our approach to thinking about the best regulatory tools to use to tackle the climate-finance doom loop is based on a two-pronged approach articulated around efficiency and speed of implementation.

In the EU regulatory landscape, adopting new risk weights for specific exposures requires reforming the Capital Requirements Regulation in its initial version adopted in 2013 (CRR)[38] or in its second version adopted in 2019 (CRR2)[39] . With a view of targeting a European Union wide application of the recommended prudential treatment of fossil fuel exposures, we make Articles 128 and 501 of CRR2 our favourite vehicles for that purpose.

Given the urgency of the situation, we also recommend an immediate activation of Article 459 of CRR by the European Commission. Article 459 of CRR gives the European Commission the possibility to take action by issuing delegated acts *"to impose, for a period of one year, stricter prudential requirements for exposures where this is necessary to address changes in the intensity of micro-prudential and macro-prudential risks".* We argue that using Article 459 of CRR would be the most efficient way to have the necessary measures in place without waiting for the reform of Articles 128 and 501 of CRR2 to be adopted. Given the urgency of the situation and the powers given to the European Commission to make use or Article 459, we see no reason not to make immediate use of Article 459 to adjust the risk weights applying to fossil fuel exposures. Obviously, once Articles 128 and 501 have been adopted and enforced, the need for Article 459 will not be there any longer. Using Article 459 of CRR should therefore be seen as the possibility to adopt a measure of urgency until the new risk weights have been inscribed in Articles 128 and 501 of CRR2.

For the sake of completeness, we also look at other possible means of taking similar measures, and in particular the means proposed by Articles 133 of CRD4 and 458 of CRR. We conclude that they may not be the best vehicles to take the necessary measures given their focus on financial stability risk incurred at national level.

I. Acting without waiting: EU-wide vs. national measures

1. EU-wide measures: activating immediately Article 459 of CRR

Extract of Article 459:

> *"The Commission shall be empowered to adopt delegated acts in accordance with Article 462, to impose, for a period of one year, stricter prudential requirements for exposures where this is necessary to address changes in the intensity of micro-prudential and macro-prudential risks which arise from market developments in the Union or outside the Union affecting all Member States, and where the instruments of this Regulation and Directive 2013/36/EU are not sufficient to address these risks, in particular upon the recommendation or opinion of the ESRB or EBA, concerning:*
>
> *(a) the level of own funds laid down in Article 92;"*

38 Regulation (EU) no 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending regulation (EU) no 648/2012

39 Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 may 2019 amending regulation (EU) no 575/2013 as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and regulation (EU) no 648/2012

Article 459 of CRR is adapted to the situation we have to address. We are clearly in a situation where *"stricter prudential requirements for exposures have become necessary to address changes in the intensity of micro-prudential and macro-prudential risks which arise from market developments in the Union or outside the Union affecting all Member States"* as the combination of micro-prudential and macro-prudential risks is a key characteristic of the climate-finance doom loop. Moreover, the provision of Article 459 of CRR giving as a condition *"where the instruments of this Regulation and Directive 2013/36/EU are not sufficient to address these risks"* fits exactly the reason why we are pleading for an activation of Article 459 today: this activation aims at taking today urgent prudential measures until they can be inscribed in Articles 128 and 501 of CRR2 (see below). Finally, Article 459 of CRR is simple to implement as it states *"The Commission is empowered"*: it is only a case for the European Commission to decide to act. It has to be noted that the article adds, as a precision, *"in particular upon the recommendation or opinion of the ESRB or EBA"* and that *"in particular"* makes for a possibility, but not an obligation. The only condition imposed on the European Commission on the use of Article 459 of CRR is ex-post: *"The Commission, assisted by the ESRB shall, at least on an annual basis, submit to the European Parliament and the Council, a report on market developments potentially requiring the use of this Article."*

The climate-finance doom loop is a market development bearing tremendous micro-prudential and macro-prudential risks. It is therefore clear that, notwithstanding any form of inaction bias, the European Commission has not only the possibility, but also the obligation under Article 191 TFEU, to trigger Article 459 of CRR without delay. In line with the analysis developed in chapter 4, we advocate that the European Commission should apply, through Article 459 of CRR, a risk weight of 150% to exposures linked to existing business of fossil fuel companies and a risk weight of 1250% for exposures deriving from new fossil fuel business.

Triggering Article 459 would have the immense merit of starting to address the climate-finance doom loop immediately. It should be seen as a temporary measure until the reform of Articles 128 and 501 of CRR2 advocated below introduces the new capital requirements factors of 1.50 and 12.50 in the regulation, a process that could take about a year from inception to adoption. In that context, the one-year limitation of the measures adopted through Article 459 should not be seen as a downside but rather as a characteristic compatible with the situation to manage and its urgency.

2. Why national measures are not the first choice: Articles 458 of CRR and 133 of CRD4

Two other provisions of CRR and CRD4 also seem at first sight to be possible solutions to take action and deserve, as such, to be explored. However, after careful consideration, their focus on financial stability risk incurred at national level do not make them, in our view, the first choice of tools to address the financial stability risk created by the climate-finance doom loop.

i. Article 458 of CRR ("Macro-prudential or systemic risk identified at the level of a Member State") is the first one of those two possibly coherent alternatives.

Article 458 states that:

> *"Where the (competent national) authority…identifies changes in the intensity of macro-prudential or systemic risk in the financial system with the potential to have serious negative consequences to the financial system and the real economy in a specific Member State and which that authority considers would better be addressed by means of stricter national measures, it shall notify the European Parliament, the Council, the Commission, the ESRB and EBA of that fact and submit relevant quantitative or qualitative evidence of all of the following:*
>
> *(a) the changes in the intensity of macroprudential or systemic risk;*
> *(b) the reasons why such changes could pose a threat to financial stability at national level;*
>
> *[…]*

(d) draft national measures for domestically authorised institutions, or a subset of those institutions, intended to mitigate the changes in the intensity of risk and concerning:
(i) the level of own funds laid down in Article 92;"

We believe that Article 458 of CRR is not the ideal tool to take immediate action to tackle the climate-finance doom loop as the serious negative consequences to the financial system and the real economy of the climate-finance doom loop are not specific to any particular Member State of the EU, and the threat to financial stability will not be felt at national level: climate change will not stop at the border of Member States, nor will its impact on the economy and on the financial system. The climate-finance doom loop is not a national problem and measures aiming at tackling issues specific to Member States do not seem therefore best adapted to the situation before us. Moreover in the case of Article 458, the fact that it was designed as a Pillar II tool to allow for national flexibility and that it requires a rather heavy procedure to trigger (involvement of the European Parliament, the Council, the Commission, the ESRB and the EBA) makes it less suitable, in our view, as a tool to take speedy action.

ii. Article 133 of CRD4 ("Requirement to maintain a systemic risk buffer") is the second one of those two seemingly possible alternatives.

Article 133 of CRD4 states that:

"1. Each Member State may introduce a systemic risk buffer of Common Equity Tier 1 capital for the financial sector or one or more subsets of that sector, in order to prevent and mitigate long term non-cyclical systemic or macroprudential risks not covered by Regulation (EU) No 575/2013, in the meaning of a risk of disruption in the financial system with the potential to have serious negative consequences to the financial system and the real economy in a specific Member State.

[…]

3. For the purpose of paragraph 1, institutions may be required to maintain, in addition to the Common Equity Tier 1 capital maintained to meet the own funds requirement imposed by Article 92 of Regulation (EU) No 575/2013, a systemic risk buffer of Common Equity Tier 1 capital of at least 1 % based on the exposures to which the systemic risk buffer applies in accordance with paragraph 8 of this Article, on an individual, consolidated, or sub-consolidated basis, as applicable in accordance with Part One, Title II of that Regulation. The relevant competent or designated authority may require institutions to maintain the systemic risk buffer on an individual and on a consolidated level.

[…]

9. The systemic risk buffer shall apply to all institutions, or one or more subsets of those institutions, for which the authorities of the Member State concerned are competent in accordance with this Directive and shall be set in gradual or accelerated steps of adjustment of 0,5 percentage point. Different requirements may be introduced for different subsets of the sector."

We believe that Article 133 of CRD4 may not be the optimal tool either to take immediate action to tackle the climate-finance doom loop for the same reason as Article 458 of CRR, as it is meant to address the *"risk of disruption in the financial system with the potential to have serious negative consequences to the financial system and the real economy in a specific Member State"*, whereas the risk we are dealing with here is not Member State specific.

II. Reforming CRR2 as a permanent solution: Articles 128 and 501

1. Article 128 of CRR2 as the most efficient way of applying a risk weight of 150% to existing fossil fuel exposure

As previously described, Article 128 of CRR2 deals with "Items associated with particular high risk" and assigns *"a 150 % risk weight to exposures that are associated with particularly high risks"*.

Including exposures to existing fossil fuel business to Article 128 of CRR2 would simply take adding a paragraph 2 ***(d)*** as follows:

> *2. For the purposes of this Article, institutions shall treat any of the following exposures as exposures associated with particularly high risks:*
>
> *(a) investments in venture capital firms, except where those investments are treated in accordance with Article 132;*[40]
>
> *(b) investments in private equity, except where those investments are treated in accordance with Article 132;*
>
> *(c) speculative immovable property financing.';*
>
> ***(d) exposures to existing fossil fuel companies, activities, reserves and to fossil fuel power plants.***

2. Article 501 of CRR2 as the most efficient way of applying a risk weight of 1250% to new fossil fuel exposure

This article could be written as follows, in a manner similar (in reverse) to CRR's current Article 501 of CRR2 introducing a so-called "SME supporting factor", and it could read as follows:

> ***"Capital requirements for credit risk on exposures to fossil fuel companies, activities, reserves and to fossil fuel power plants shall be multiplied by the factor 12.50 for the business of exploring, extracting or exploiting new coal, oil and gas resources or developing new fossil fuel power plants".***
>
> ***2. For the purpose of this Article:***
>
> ***(a) A fossil fuel company or activity is defined as a company or facility engaged in coal, oil, gas, shale gas or bituminous sand exploration, production or exploitation;***
>
> ***(b) Fossil fuel power plants are plants burning coal, oil, natural gas or shale gas to produce power;***
>
> ***(c) Fossil fuel resources are defined as coal, oil, natural gas, bituminous sand and shale gas".***

The Council and the European Parliament agreed in December 2018 to amend the EU's prudential and resolution rules for banks through an evolution of the Capital Requirements Regulation and Directive (CRR/CRD IV). In such a context, amending CRR in the direction described in this section can become part of the overhaul of the prudential regulation implied by this so-called "banking package" and could be adopted as part of the 2020 review.

40 As mentioned in chapter 4, Article 132 CRR2 deals with exposures in the form of units or shares in CIUs (Collective Investment Units), which receive a 100% risk weight. It is therefore not relevant for the situation we are investigating here.

The two different pathways described above for adjusting banks' capital requirements linked to fossil fuel exposures (activating Article 459 of CRR and amending CRR2) have different timelines. They are complementary to one another from a sequencing standpoint but they lead to the same result, i.e. adapting banking prudential regulation to tackle the climate-finance doom loop. Once CRR2 has been amended and the new capital requirements for fossil fuel exposures have entered into force, Article 459 will not be necessary any more. Given their different time to implementation, both procedures should be kick-started without delay by policy-makers.

As a consequence, the institutional action plan to implement the measures proposed in this policy-paper in the European Union reads as follows:

1. **The European Commission should activate Article 459 of CRR in order to take immediate action;**
2. **The European Commission should include the amended risk weights in Articles 128 and 501 of CRR2 as part of the 2020 review of CRR/CRD, with a view of having the revised articles adopted by the European Parliament and the Council of the European Union and applied as soon as possible.**

Conclusion

Overcoming the inaction bias

In addition to highlighting the fragility of our economy, two of the lessons from the Covid-19 crisis are that public money is not scarce when the survival of our societies is at stake, and that policy-makers have a strong ability to react to adverse circumstances.

We can only rejoice in this ability of policy-makers to make urgent and radical decisions when the essential, i.e. lives and the functioning of human societies, is threatened. But a constant of public life, demonstrated once again by the contrast between the reaction to the Covid-19 crisis and the lack of action on climate change, is that policy-makers are, like all of us, much better at reacting to an existing crisis than at acting to prevent a looming crisis. Strikingly, this is true even when the coming crisis is certain and its consequences dismal as is the case with climate change.

In March 2014, the ESRB was giving in its Flagship Report on Macro-prudential Policy in the Banking Sector[41] a description of the reasons why regulators must and can act in such circumstances. Among the reasons mentioned by the ESRB was *"preventing and mitigating systemic risks to financial stability"*, *"preventing and mitigating direct and indirect exposure and concentrations"* and, last but not least, the *"need for policy-makers to overcome the inaction bias"*. The inaction bias mentioned by the ESRB could also be described as a natural but unwelcome short-term bias.

Bank lending is the main enabler of fossil fuel exploitation, and fossil fuel exploitation is itself the main enabler of climate change. Given the now widespread recognition of the threat to financial stability represented by climate change, we are facing a situation where bank lending threatens the very existence of banks: this is what we called the climate-finance doom loop.

The action suggested to policy-makers in this report to tackle the link between climate change and financial instability is far less radical and much cheaper than the action they took to react to the Covid-19 crisis. Without dismissing the seriousness of the Covid-19 pandemic situation, it would also solve a much bigger and much longer lasting problem. Importantly, it is founded on the precautionary principle of Article 191 of the Treaty on the Functioning of the European Union, which aims at ensuring a higher level of environmental protection through preventive decision taking in the case of risk and explicitly refers to combating climate change.

Given the predominance of bank lending in bringing finance to fossil fuel companies, setting banks' prudential risk weights at 150% for existing fossil fuel exposures and at 1250% for new fossil fuel exposures would go a long way towards tackling the climate-finance doom loop and therefore the threat to financial stability represented by climate change. However, banks are not the only providers of finance to the economy and therefore to the fossil fuel industry. Moreover, adopting the banking risk weights advocated by this report could have the effect of pushing fossil fuel companies to look for alternative sources of financing, in particular from insurance companies and investors of all kinds. This is why Finance Watch will address the issue from the standpoint of insurance companies and investors in another report. Macro-prudential regulation must have a financial stability objective and should not have the consequence of pushing business from one category of financial actors to the other.

The angle taken in this report is EU oriented, but the climate-finance doom loop and the threat it represents for financial stability are global. According to the Fossil fuel report 2020 of Rain Forest Action

41 ESRB - Flagship Report on Macro-prudential Policy in the Banking Sector, March 2014

Network *"Banking on Climate Change"*,[42] EU banks count for 11 among the 35 biggest banking lenders to the fossil fuel industry, the other members of the league being (in order of importance) American, Canadian, Japanese, British, Chinese and Swiss. This, very simply, calls for the risk weight measures we advocate for to be adopted at a global level. Two institutions will be central in this process: the Basel Committee on Banking Supervision (BCBS) with its role as the primary global standard setter for the prudential regulation of banks, and the Financial Stability Board (FSB) with its role of promoting international financial stability.

Tackling the impact of climate change on financial stability is a realistic objective. One might even argue that, given the importance of the subject and its enormous impact for human societies, the cost of the measures needed to do so is particularly moderate. This is not to say that those measures will not hurt some private interests in the short term but, with all the understanding that one can have for private actors defending their interest, there is no doubt that the public interest commands action on this matter and that it is the duty of policy-makers to do so. If they do not, they will have to answer to the greater public and to citizens why they chose not to act while they had the possibility and the tools to do so.

42 Rain Forest Action Network: "Banking on Climate Change" – Fossil fuel report 2020

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Finance Watch is an independently funded public interest association dedicated to making finance work for the good of society. Its mission is to strengthen the voice of society in the reform of financial regulation by conducting advocacy and presenting public interest arguments to lawmakers and the public. Finance Watch's members include consumer groups, housing associations, trade unions, NGOs, financial experts, academics and other civil society groups that collectively represent a large number of European citizens. Finance Watch's founding principles state that finance is essential for society in bringing capital to productive use in a transparent and sustainable manner, but that the legitimate pursuit of private interests by the financial industry should not be conducted to the detriment of society. For further information, see www.finance-watch.org

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