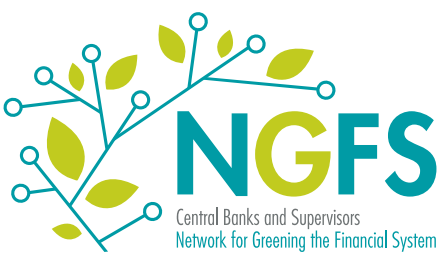
NGFS First Progress Report

OCTOBER 2018

NGFS
Central Banks and Supervisors
Network for Greening the Financial System

NGFS
First Progress Report

OCTOBER 2018



Executive summary

The Network for Greening the Financial System (NGFS), launched at the Paris One Planet Summit on 12 December 2017, is a group of 18 Central Banks and Supervisors and 5 international organizations willing, on a voluntary basis, to contribute to the analysis and management of climate and environment-related risks in the financial sector, and to mobilize mainstream finance to support the transition toward a sustainable economy. Its purpose is to define and promote the implementation of best practices within and outside of the Membership of the NGFS and to develop analytical work on green finance. Its work is built on a range of national and international initiatives responding to the financial risks and opportunities stemming from climate – and environment – related changes, such as the Task Force on Climate-related Financial Disclosures (TCFD) and the G20 Green/Sustainable Finance Study Group as well as broader international activity such as the Paris Agreement and Sustainable Development Goals (SDGs).[1]

The key messages from the first phase of NGFS work as reflected in this progress report are outlined below:

1. NGFS Members acknowledge that climate-related risks are a source of financial risk. It is therefore within the mandates of Central Banks and Supervisors to ensure the financial system is resilient to these risks. As set out in the academic literature, climate change will affect the global economy and so the financial system that supports it. The financial risks it presents are in consequence system-wide and potentially irreversible if not addressed. Exact pathways may be uncertain but it is foreseeable that financial risks will crystallize in some form through either the physical or transition channel, or some combination of them both. And while the financial risks may be realized in full over extended time horizon, the risks call for action in the short-term to reduce impact in the long-term. Some NGFS members have extended this analysis to broader environmental risks finding that these are a source of financial risk as well.

2. Against this backdrop, authorities and financial institutions need to develop some new analytical and supervisory approaches, including those based on forward looking scenario analysis and stress tests. Action is required now to reduce future financial risk although historical data is not sufficient to estimate this impact. The nature of the risk factors requires an enhanced approach, one that is forward looking and takes a long-term perspective. There may also be benefit of using data driven stories based on future potential scenarios as well as traditional analytics and quantitative risk modelling.

3. Central Banks and Supervisors, as well as financial institutions, are beginning to deepen their understanding of these risks and the need for an improved approach. The stock-taking exercise conducted within NGFS Members shows that Supervisors are starting to actively assess the prudential risks and begin to set supervisory expectations to enhance financial risk management of supervised firms. A growing number of financial institutions have also conducted their own climate and environment-related analysis.

4. The tools and methodologies, however, are still at an early stage and there are a number of analytical challenges. For example, the quality and availability of data is limited, taxonomies and definitions are still developing and there is a need to build intellectual capacity in translating the science into decision-useful financial risk assessment information. More work is also needed to assess whether a financial risk differential exists between "green" (low-carbon) and "brown" (carbon and pollution-intensive) assets.

5. Some Central Banks are also starting to play their part in scaling up green finance by accounting for climate and environment-related factors in their investment strategies for instance. A few Central Banks, regulators and local authorities have introduced incentives for banks to increase green lending and for issuers to issue green bonds.

In the coming months, the NGFS will carry on its work on the following deliverables which will feature in its first comprehensive report to be published by April 2019:

• Narrowing down the complexity of risk analysis, e.g. through the development of a small number of high

1 *https://www.banque-france.fr/en/communique-de-presse/joint-statement-founding-members-central-banks-and-supervisors-network-greening-financial-system-one*

level scenarios, in line with TCFD recommendations on the use of scenario analysis as a helpful tool for assessing future risks and opportunities.

• Analyzing the outcomes of the stock-take of supervisory and macro-prudential approaches to enhance firms' financial risk management, assess systemic risks and support disclosure.

• Taking forward further analysis of potential risk differential between "green" and "brown" assets, identifying gaps where further work needs to be carried out and appropriate Central Bank and Supervisory responses.

• Doing further work to identify some specific areas for Central Banks and Supervisors to "lead by example" and integrate climate-related criteria in a growing number of their operations.

1. Climate-related risks are a source of financial risk and fall within the supervisory and financial stability mandates of Central Banks and Supervisors[2]

The NGFS conducted its review based on the broadly agreed definition of the two main channels of transmission of climate-related risks – physical and transition – which are used by authorities for the purpose of Environmental Risk Analysis (ERA).[3]

1.1 Physical and transition risks will impact macroeconomic conditions on the demand side as well as on the supply side and can potentially result in large financial losses

Physical risks are categorized as acute when they arise from climate- and weather-related events, such as droughts, floods, storms and sea-level rise and chronic when they arise from progressive shifts in climate and weather patterns such as increasing temperatures. They comprise impacts directly resulting from such events and shifts, such as damage to property or reduced productivity, and also those that may arise indirectly through subsequent events, such as the disruption of global supply chains.

There is a number of supply and demand channels through which physical risks can impact on the macro-economy. On the demand side, losses deriving from extreme weather events such as floods and storms could reduce household wealth and therefore private consumption. Business investment could also be reduced by damage to physical and financial assets as well as by uncertainty about future demand and growth prospects. Besides, current consumer preferences could change towards greener consumption. There will be global impacts with some winners and losers but the global welfare losses are likely to be substantial.

The main *supply*-side shocks are represented by a shortage of availability of inputs produced locally or imported, by the volatility in import prices as a result of these shortages, and by the damages to the capital stock and infrastructure, including through transportation disruption. More broadly, physical climate change could have large impacts in terms of reducing the potential of the economy to grow in the future, by reducing labor productivity and diverting resources from investment in current productive capital and innovation to climate change adaptation.

Physical risks can potentially result in large financial losses that can have micro as well as wider systemic impacts. Financial institutions can be affected by physical risk directly, for instance by reduced value of assets and collateral,[4] increasing insured damages,[5] or by disrupting their own business operations[6] (e.g. power outages, branch closures[7]). If losses are insured, they can directly affect insurance firms through higher claims. If losses are uninsured, the burden can fall on households, corporates and states. This can impair asset values, for example through increasing sovereign risk, and reduce the value of investments held by financial institutions. It can also increase credit exposures for banks and other lenders.

Financial institutions can also be affected by physical risk indirectly, for instance by impairing business conditions for the real economy and creating political instability due to rising migration or increased mortality due to worsened living conditions.[8]

Transition risk is the financial risk which can result from the process of adjustment towards a lower-carbon economy prompted, for example, by changes in climate policy, technology or market sentiment.

There is a wide range of estimates from the literature on what the overall impact could be on the macro-economy from transition factors. Economic costs can arise from the need, in some sectors, to switch from high to low carbon technologies. As some sectors, for instance, aviation or cement and steel production currently have limited low-carbon alternatives, they will be prone to higher emission costs. However, others have argued that there could be a positive "green growth" effect, meaning that ambitious climate policies associated with structural reforms could increase investment and could actually benefit the global economy in the short- and in the medium-term.[9]

2 Some NGFS members have extended this analysis to broader environmental risks, which are also being considered within supervisory and financial stability mandates.

3 Environmental Risk Assessments (ERA) are a concept developed at the G20 level (Green Finance Study Group, *Green Finance Synthesis Report*, July 2016).

4 Scott et al., *The Bank of England's response to climate change*, 2017.

5 DNB, *Waterproof?*, 2017; Finansinspektionen, *Climate Change and Financial Stability*, March 2016.

6 Stenek et al., *Climate Risk and Financial Institutions*, 2010.

7 German Federal Ministry of Finance, *Climate change and financial markets*, 2016.

8 DNB, *Waterproof?*, 2017.

9 OECD, *Investing in Climate, Investing in Growth*, 2017.

If not well managed, the transition could prompt a reassessment of the value of a wide range of assets, for example equities, bonds and derivatives, as well as the broader capital stock used in an economy, as changing costs and opportunities become apparent. This may have implications for asset holders as well as other financial institutions such as banks that assist clients in managing financial risk. Business risks such as reputational or liability risks could also arise when parties suffer losses related to climate change.

The impact of the transition risk may depend on the timing as well as the speed of the transition (early versus delayed transition and/or gradual versus abrupt transition). The speed at which any re-pricing may occur is uncertain but could be important for financial stability and the safety and soundness of financial firms. Overall, if it is gradual and starts early, the macro-economic costs and risks to financial stability can be minimized but transition risks would likely be most pronounced in the case of a late and abrupt transition.

1.2 Supervisors and financial institutions are starting to adapt their practices to address climate and environment-related risks

Supervisors have started to actively assess the impact of climate and environment-related risks on prudential risks and are beginning to set expectations to enhance the financial risk management of supervised firms. However, there are challenges to undertaking analyses e.g. on how physical effects of climate change will affect risks on asset-level and the extent to which a financial risk differentials exists between "green" and "brown" assets.

Environmental Risk Assessment (ERA) by supervisory authorities is becoming more and more commonplace, albeit still evolving. The first step to achieve successful integration of climate and environment-related risks into supervision is to assess possible impacts on financial institutions from both physical and transition effects of climate change. Environmental Risk Assessment refers to the methods and modelling techniques used to size the financial impact of climate and environment-related risks to micro-prudential objectives. Over the last few years, progress has been made to size the financial risks from climate change from both physical and transition risks. Some members have sized the risks from broader environmental concerns as well.

The stock-taking shows that the maturity of the ERAs varies across authorities. Current practices include a range of qualitative and quantitative approaches, with qualitative methods particularly effective for considering longer-term scenarios, and quantitative methods giving greater visibility of shorter-term financial exposures. Understanding best practices within the private sector can be helpful to advance this further.

To support ERA and the integration of climate and environment-related factors into supervision, authorities are building in-house capacity and collaborating within their institutions, with other supervisors, and with wider stakeholders. A key aspect of capacity building is improving Supervisors' understanding of the financial risks from climate and environment-related factors and the distinct characteristics of those risks, such as the timing mismatch between action and impact.

So far the integration of climate and environment-related factors into prudential supervision has been limited. Most authorities are focused on raising awareness; some are beginning to consider setting supervisory expectations. As prudential regulation should not be used for non-prudential purposes, all Members bind the decision on adjustments to prudential regulation on the evidence of a risk differential between the related exposures. Most authorities appear to be focused on engaging with financial firms to help build intellectual capacity. Only one authority (the PBOC) has introduced "green supporting factors", not through a change in capital requirement, but via a green re-lending facility (which provides low-cost liquidity for banks to extend green loans) and by including green performance measurement in macro prudential assessment (MPA) of commercial banks.

In most jurisdictions, the default rates of "green" and "brown" assets have not been evaluated. Differentiating between "green" and "brown" assets is a challenge as the available data is not based on a standardized method of classification. A common reason given by jurisdictions is the difficulty in achieving a consistent and comparable classification of "green" and "brown" assets. A clear taxonomy can help overcome this issue and harmonize the classification of assets on a global scale.

1.3 Disclosure frameworks are in place, or are being developed, but there are differences in disclosure practices across different jurisdictions

The stock taking exercise conducted within NGFS Members also shows that financial institutions and authorities are developing disclosure frameworks. The robust disclosure of climate and environment-related information by financial institutions' key role is mainly as threefold:

- First, it is integral to an efficient, well-functioning capital market, by improving the pricing mechanisms for climate and environment-related risks, and contributing to more efficient allocation of capital;

- Second, it will also enable market players, as well as policymakers, to quickly identify and capitalise on climate and environment-related opportunities, which will contribute to the continued growth of the green finance ecosystem;

- Third, the discipline of public disclosure requires financial institutions to establish the necessary data collection and procedures to better identify and manage their risks. Better disclosure therefore can lead to better risk management.

There are differences in environment- and climate-related disclosure practices across jurisdictions, in terms of what and how to disclose. Most jurisdictions have in place or are planning to implement some form of environment – and climate-related disclosure requirements for their entities. Disclosures may be mandated through legislation, and/or encouraged through bottom-up industry initiatives and guidelines. In general, most of the jurisdictions with disclosure requirements would set out what to disclose, but accord entities with some flexibility on how to comply.

Investors and, in general, market participants would benefit from a more standardized framework for environmental disclosures. The TCFD recommendations provide a possible avenue of convergence for a global standardized framework on climate-related disclosures, for both financial and non-financial companies. There is a significant level of awareness amongst Central Banks, Supervisors and regulated entities on the recommendations. Despite being voluntary in nature, this has not impeded rising adoption of TCFD recommendations by financial institutions. While most firms are only at the stage of reviewing and understanding their implications, certain firms have gone further to engage external consultants for guidance on implementation of the recommendations.

1.4 The stock-take conducted by the NGFS among its Members and Observers has also highlighted a number of challenges for financial Supervisors and Central Banks as well as for financial institutions

Data availability is limited, which impedes the ability of authorities and financial institutions to undertake risk assessment and for firms to carry out climate and environmental disclosure. Quality of data is also affected by limited information available on climate and environmental disclosure and sustainability practices of financial institutions' corporate clients. Access to asset-level data is a particular challenge.

Taxonomy and definitions around "green" and sustainable assets will be important for clearly defining the terms 'green' and 'brown' in relation to climate and other environmental considerations as appropriate, the creation of "green" (and "brown") labels but also in achieving consistency in the classification of "green" versus "non-green" assets as a base in an analysis of potential risk differentials between different types of assets.

Timing mismatch between action and impact means a long-term perspective is required to ensure actions today are considered in light of future impacts.

The need for capacity building is underscored by several challenges, including the need to translate the scientific understanding of climate change and environmental factors into financial risk assessment, as well as minimizing the increased administrative burden and compliance costs on financial institutions arising from the need for higher quality climate and environmental disclosures.

2. Authorities and financial institutions need to develop some new analytical and supervisory approaches based on forward looking scenario analysis

2.1 Sizing climate-related risks and assessing their macroeconomic and financial stability impact is complex due to the time mismatch between actions and impacts

A relevant analysis needs to focus on long-term consequences while accounting for historically unprecedented risks and the possibility of major irreversible changes. The time horizon, discount rate, timing of reaction, as well as the evolution of policies and technologies are difficult assumptions to establish under uncertainty and diverging climate scenarios. Thus, the results vary deeply across regions and sectors and are characterized by a high degree of uncertainty, leaving a wide analytical gap to be filled-in. **The range of estimations calls for an important work of mapping and rationalizing the assumptions.** Moreover, financial stability assessment using modelling approaches necessitates extensive granular data which are currently lacking.

The nature of the risk factors requires an enhanced approach, one that is forward looking and takes a long-term perspective. As the full impact of climate change may be felt in the longer-term, historical data may not be sufficient. There may also be benefit of using data-driven stories based on scenarios as well as traditional analytics and quantitative risk modelling, in line with TCFD recommendations. For example, at a high level, there are many possible scenarios, including those where internationally determined climate and environmental goals are not met, accounting for various timings of market transition (i.e. a late and abrupt transition).

2.2 The integration of climate-related risks into macroeconomic surveillance and financial stability assessments is facing some analytical and methodological challenges

Whereas macroeconomic forecasting is fully developed in each NGFS jurisdiction, on different time horizons and with energy prices included as a production factor, **climate-related risks do not appear to feature in forecast models nor as qualitative input factor**. Some jurisdictions have started to model some of the impacts of climate-related risks on the macroeconomy and financial stability, with ad hoc models. These seek to identify transmission channels from climate change and the transition to macroeconomic variables of interest, the impact of natural disasters on trade flows, and the accumulation of transition risk. Some impact studies on specific economic sectors are under development as well.

NGFS Members apply different monitoring tools to understand the financial stability risks posed by physical risks and transition risks. These include:

- Presenting climate-related physical risks indicators (temperature anomalies, CO2 emissions, losses from relevant natural disasters, impact of hydro-meteorological phenomena);

- Assessing the exposures of banks and insurers to carbon intensive and climate vulnerable sectors;

- Monitoring returns on equity/CDS/equity index of carbon intensive and climate vulnerable sectors;

- Stress tests, mostly via top-down cliff edge analysis, leveraging previous academic findings for the severity of the stress, to assess the short term impact of a climate event on financial institutions' balance sheets. These stress tests apply to banks, insurance companies, pension funds, mutual funds and brokerage houses;

- Analysis to see how aligned the portfolios of financial institutions are with the transition, and what the potential financial stability risks could be.

3. Central Banks are also beginning to play their part in scaling up green finance

3.1 Central Banks are taking actions to reduce their climate/environmental impact and some of them account for climate- or environmental-related factors in their investment strategies

It appears from the NGFS review that sustainability criteria still play a minor role in most of the NGFS Central Banks' own funds portfolio management. However, several institutions are planning or at least considering deepening

the integration of sustainability criteria in their portfolio management framework. Against this background, the NGFS and De Nederlandsche Bank organized a conference on this topic in September in Amsterdam. Representatives from circa 50 different Central Banks and policy institutions discussed best practices and corresponding challenges concerning the integration of sustainability criteria into the management of their own funds, pension funds and official reserves.

Credit assessments show a similar picture: climate- or environmental-related criteria are not yet sufficiently accounted for in internal credit assessments or in the models of credit agencies' models which many Central Banks rely on for their operations. The typically short time-horizon of these assessments has (to date) limited the possibility of considering long-term effects. First attempts to integrate these factors have already been made by a few Members, whose experience may provide useful lessons for others emulating such approaches in the future. One Central Bank has announced that it will sign the Principles for Responsible Investment in 2019.

Most NGFS Central Banks do not take into account climate-related risk in the conduct of their monetary policy. Nevertheless, many of them have recently invested in green assets within the scope of their quantitative easing programmes. Yet these investments were as a consequence of market neutral asset purchases rather than targeted support for green finance. Among NGFS Members, so far only one Central Bank, the People's Bank of China, has a dedicated policy to promote green finance via monetary policy.

3.2 There is room for Central Banks and Supervisors to "lead by example" and integrate climate-related criteria in a growing number of their operations

To incorporate sustainability criteria into Central Banks' and Supervisors' activities and, when this falls within an authority's mandate, actively support green finance, a thorough grasp of the market and its dynamics is crucial. The understanding of these market trends, however, is hampered by the absence of comprehensive and agreed definitions on what "green" means and the fragmented nature of the market itself. NGFS Members seek to monitor and analyze market developments and participate in a variety of fora and private sector initiatives. This kind of involvement of NGFS Members in market initiatives is in line with the expectations of the industry.

Central Banks and Supervisors can stimulate the evolution and encourage the improvement of existing green market infrastructure. New green financial instruments based on green indices or derivatives could for instance be developed to improve market depth. Within the overall debate it is important to keep in mind that there are still trade-offs, which need to be balanced: soft approaches (values driven) versus hard approaches (risk driven), regulations versus market forces or harmonization versus diversity. From a financial stability perspective, the potential related financial risks have to be monitored. These are all topics that are under discussion – within both the private and public sector. Thus, there is a growing pressure from the public and industry for Central Banks and Supervisors to act. The NGFS commits itself to play an important role as a catalyst and contribute structure, clarity and orientation to this debate.

In order to explore options for Central Banks and Supervisors to facilitate the mainstreaming of green finance, it is important to understand the industry as well as the academic views. Therefore, the NGFS has repeatedly sought the advice and input of experts through various workshops and conferences. In June 2018, the NGFS hosted an industry outreach in Singapore, during which market experts emphasized the potentially significant financial consequences of climate change which needed to be balanced by the fact that the industry is becoming increasingly aware of the resulting business opportunities. The role Central Banks and Supervisors could play as "public good providers" has been welcomed as a good signal. Participants also highlighted a number of obstacles to mainstreaming green finance. As a network of regulatory authorities, some industry representatives hope for the NGFS to provide guidance and to establish more clarity with regards to "green" assets. In addition, the NGFS and the Council on Economic Policies (CEP) will organize an academic conference on "Scaling up Green Finance: The Role of Central Banks", which will be hosted by the Deutsche Bundesbank on November 8-9, 2018 in Berlin. It is also key for Central Banks to identify climate-related risks as both physical and transition risks impact macroeconomic variables that are central in the monetary frameworks, as explained in more details in section 2.

Conclusion

As a conclusion, NGFS preliminary findings show that while Supervisors and Central Banks have greatly increased their efforts in understanding and assessing the magnitude of climate- and environment-related risks, this is a new discipline and they still have a long way ahead to improve their tools and methodologies. Since the establishment of the NGFS, this road ahead may still be long but is becoming clearer.

In the coming months, NGFS will carry on its work on the following deliverables which will feature in its first comprehensive report to be published by April 2019:

- Narrowing down the complexity of risk analysis, e.g. through the development of a small number of high level qualitative scenarios of transition paths in line with TCFD recommendations on the use of scenario analysis as a helpful tool for assessing future risks and opportunities.

- Continuing to stock-take supervisory and macro-prudential approaches to enhance firms' financial risk management, assess systemic risks and support disclosure.

- Taking forward further analysis of potential risk differentials between "green" and "brown" assets and appropriate Central Bank and Supervisory responses.

- Doing further work to identify some specific areas for Central Banks and Supervisors to "lead by example" and integrate climate-related criteria in a growing number of their operations, including the management of own funds, pension funds and official reserves.

List of NGFS Members and Observers

Chair: Frank Elderson (DNB)

Secretariat: Banque de France

Members	Observers
BaFin- Bundesanstalt für Finanzdienstleistungsaufsicht	Bank for International Settlements
Banco de España	European Bank for Reconstruction and Development
Banco de Mexico	Organisation for Economic Cooperation and Development
Bank Al Maghrib	Sustainable Insurance Forum
Bank of England	World bank and the International Finance Corporation
Bank of Finland	
Banque centrale du Luxembourg	
Banque de France and Autorité de contrôle prudentiel et de résolution	
Banque nationale de Belgique	
De Nederlandsche Bank	
Deutsche Bundesbank	
European Central Bank	
Japan Financial Services Agency	
Monetary Authority of Singapore	
Oesterreichische Nationalbank	
People's Bank of China	
Reserve Bank of Australia	
Swedish Finansinspektionen	

Selected publications by NGFS members

Banco de España (BdE)

José Manuel Marqués Sevillano and Luna Romo González, *The risk of climate change for financial markets and institutions: challenges, measures adopted and international initiatives*, May 2018.

Bank of England (BoE)

Matthew Scott, Julia van Huizen and Carsten Jung *The Bank's response to climate change*, June 2017.

Transition in thinking: The impact of climate change on the UK banking sector, September 2018.

Banque de France (BDF) and Autorité de contrôle prudentiel et de résolution (ACPR)

French Treasury, Banque de France and ACPR, *Assessing climate change-related risks in the banking sector*, 2017.

Bank for International Settlements (BIS)

Torsten Ehlers and Frank Packer, *Green bond finance and certification*, 2017.

De Nederlandsche Bank (DNB)

Waterproof? An exploration of climate-related risks for the Dutch financial sector, 2017.

Time for Transition: an exploratory study of the transition to a carbon-neutral economy, 2016.

Sustainable investment in the Dutch pension sector, 2016.