



OMFIF Special report

# Central banks and climate change

The global central banking community spent the last decade repairing the financial system after the international banking crisis. Now, it is turning its attention increasingly to the longer-term challenge of improving the climate resilience of the financial system and the wider economy.





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# Addressing climate risks to economies

The past year has seen unprecedented levels of public interest in the effects of climate change on our economies and societies. This was evidenced by the birth of the Extinction Rebellion movement and the rise of 16-year old activist Greta Thunberg. In October, William Nordhaus won the Nobel prize in economics for his work on the economic modelling of climate change. That same month, the United Nations Intergovernmental Panel on Climate Change issued alarming warnings. And for the third consecutive year, the World Economic Forum's annual report, presented in Davos in January 2019, counted three environmental risks – all associated with climate change – among the top five global risks in terms of both likelihood and impact. In April 2019, not-for-profit organisation Positive Money launched a petition calling on the Bank of England to step up its efforts to address climate change. Titled '#GreentheBoE', it gathered more than 4,000 signatures in a matter of hours.

### **New frontier for central banks**

As these events indicate, climate change is a matter that extends beyond activists, governments, and private companies. Central banks, banks and insurance companies are realising increasingly the need to take climate change into account in their decision-making and the reasons go beyond mere window-dressing. In December 2017 during the One Planet summit and at the initiative of the Banque de France, eight institutions from four continents set up the Central Banks and Supervisors Network for Greening the Financial System. Chaired by Frank Elderson, executive director for supervision at De Nederlandsche Bank, the group has since grown to 36 members from 29 jurisdictions. Collectively, they cover around 31% of the world population and almost half of global GDP and global greenhouse emissions (see Figure 1). They supervise two thirds of the world's global systemically important

banks and insurers. The network also includes observer and stakeholder members such as the Bank for International Settlements, the World Bank, the Organisation for Economic Co-operation and Development, and OMFIF.

Central bankers' deepening interest in the subject is reflected in the growing number of speeches on issues related to climate change. These range from its impact on the economy, financial stability and monetary policy, to the development of green finance instruments and ratings. Between April 2018-March 2019, there were 23 central bank speeches on these subjects (see Figure 2). Of these, all but two were made by members of the NGFS, with the majority of speeches coming from the Eurosystem (13, including three from the European Central Bank), and the remaining coming from Asia (three), the UK (four), and Africa (one). Banque de France Governor François Villeroy de Galhau went as far as calling climate risks 'the new frontier for central banks, comparable to the financing of growth and major infrastructures in the 19th century or the management of great financial crises in the last 100 years'.

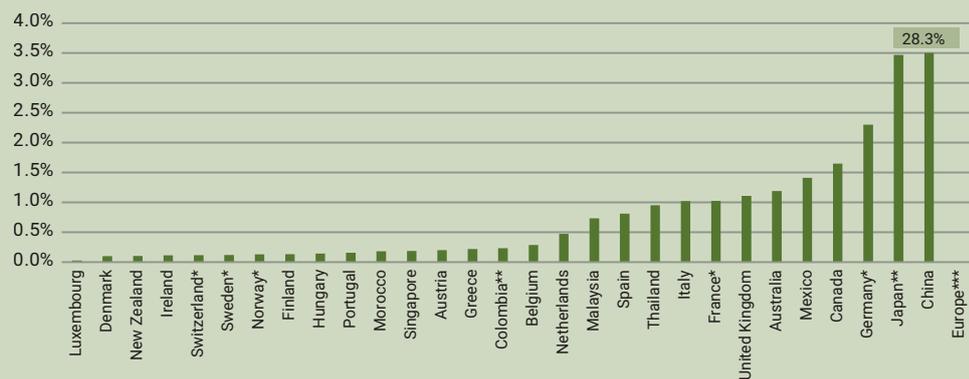
The motivation for central banks is manifold, stemming from the need to understand and explain the potential impact of climate change on the macroeconomy and more specifically, on financial stability and monetary policy. Central bankers must also assess the effects of climate change on the financial sector, as the industry mix changes to facilitate the transition to a climate-resilient economy.

Entire industries, households and businesses are likely to be affected as countries transition to low-carbon models. Economies will have to bear the cost of adaptation to a warmer climate, including increasing spending on equipment such as air conditioning and resilient infrastructure such as seawalls, which would divert resources from



**Figure 1: NGFS members' jurisdiction jointly responsible for nearly half of global carbon emissions**

Members of the Central Banks' and Supervisors' Network for Greening the Financial System (as of April 2019), by central bank jurisdiction, % of global carbon emissions



Source: Banque de France NGFS Secretariat, Global Carbon Atlas, OMFIF analysis

\*These jurisdictions are represented on the NGFS by both the central bank and the supervisory authority

\*\*These jurisdictions are represented on the NGFS by the supervisory authority only

\*\*\*Three cross-border European institutions are members of the NGFS: the European Central Bank, the European Banking Authority, and the European Insurance and Occupational Pensions Authority

**Figure 2: Central bankers' speeches on sustainability in 2018-19\***

Name	Position**	Institution	NGFS member?	Date
Sabine Lautenschläger	Member of the Executive Board	European Central Bank	Yes	17/04/2019
Frank Elderson	Executive Director of Supervision	De Nederlandsche Bank	Yes	17/04/2019
Sarah Breenen	Executive Director of International Banks Supervision	Bank of England	Yes	15/04/2019
Yannis Stournaras	Governor	Bank of Greece	Yes	03/04/2019
Guy Debelle	Deputy Governor	Reserve Bank of Australia	Yes	12/03/2019
Margarita Delgado	Deputy Governor	Banco de España	Yes	12/03/2019
Patrick Njoroge	Governor	Central Bank of Kenya	No	20/02/2019
Yannis Stournaras	Governor	Bank of Greece	Yes	16/01/2019
Philip R Lane	Governor	Central Bank of Ireland	Yes	05/02/2019
Yannis Stournaras	Governor	Bank of Greece	Yes	18/12/2018
François Villeroy de Galhau	Governor	Banque de France	Yes	28/11/2018
Yves Mersch	Member of the Executive Board	European Central Bank	Yes	27/11/2018
Mark Carney	Governor	Bank of England	Yes	21/11/2018
Benoît Cœuré	Member of the Executive Board	European Central Bank	Yes	09/11/2018
Yannis Stournaras	Governor	Bank of Greece	Yes	01/10/2018
Frank Elderson	Executive Director of Supervision	De Nederlandsche Bank	Yes	04/09/2018
Veerathai Santiprabhob	Governor	Bank of Thailand	Yes	23/07/2018
Norman Chan	Chief Executive	Hong Kong Monetary Authority	No	14/06/2018
Olli Rehn	Deputy Governor	Bank of Finland	Yes	13/06/2018
Klaas Knot	President	De Nederlandsche Bank	Yes	06/04/2018
François Villeroy de Galhau	Governor	Banque de France	Yes	06/04/2018
Mark Carney	Governor	Bank of England	Yes	06/04/2018
Sarah Breenen	Executive Director of International Banks Supervision	Bank of England	Yes	19/03/2018

\*Speeches between March 2018-April 2019 \*\* Applies to position at the time the speech was given, may not necessarily be current position

**NGFS members' jurisdictions cover:**



**31%** of the global population  
Source: United Nations, 2017



**45%** of global greenhouse gas emissions  
Source: Global Carbon Budget, 2017



**2/3** Supervision of the global systemically important banks and insurers  
Source: Financial Stability Board, 2018



**44%** of the global GDP  
Source: World Bank, 2017

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If we are to fulfil our mission of safeguarding monetary and financial stability, it is a strategic priority for us to address the challenges posed by climate change for the financial system.

Philip Lane,  
Governor of the  
Central Bank of  
Ireland

**Figure 3: Selected initiatives by international financial agencies linked to climate change**

Actor	Initiative
G20	Sustainable Finance Working Groups
United Nations	Principles for Responsible Investment
Financial Stability Board	Task Force on Climate-Related Financial Disclosures
OECD	Green Finance and Investment Centre
World Bank	Sustainable Banking Network
EU	Action Plan on Sustainable Finance
Central Banks/ Supervisors	Network for Greening the Financial System
Supervisors/ Regulators	Sustainable Insurance Forum

Source: Various sources

productive capital accumulation. This suggests that climate-related risks will be a source of financial risk. These therefore fall within the mandates of central banks and supervisors to ensure the financial system remains resilient. As Bank of Greece Governor Yannis Stournaras remarked, ‘Financial stability without a sustainable growth model is simply inconceivable.’

Reflecting these concerns, the NGFS is structured around three workstreams. The first, chaired by the People’s Bank of China, centres on microprudential supervision. It aims to identify best practice in analysing climate-related risks to individual institutions, including the disclosure of such risks. The second, chaired by the Bank of England (see Sarah Breeden and Andrew Hauser’s contribution on p.41), focuses on quantifying climate-related risks at a macroeconomic level, including macro stress tests and scenario analyses. The third workstream, chaired by Germany’s Bundesbank, addresses the role of central banks in scaling up green finance, including integrating environmental, social and governance criteria in their operational activities and management of official reserves.

While central banks have certainly shown the

**Figure 4: NGFS recommendations, April 2019**

Recommendation 1	Integrating climate-related risks into financial stability monitoring and micro-supervision
Recommendation 2	Integrating sustainability factors into own-portfolio management
Recommendation 3	Bridging data gaps
Recommendation 4	Building awareness and intellectual capacity and encouraging technical assistance and knowledge-sharing
Recommendation 5	Achieving robust and internationally consistent climate and environment-related disclosure
Recommendation 6	Supporting the development of a taxonomy of economic activities

Source: NGFS

greatest momentum, they are not the only financial system players pursuing initiatives linked to climate change. The Financial Stability Board, OECD, UN, World Bank and European Union are also leading the charge with initiatives focused on disclosures, the development of green taxonomies, and principles for responsible investment (see Figure 3).

### Climate risks to the economy

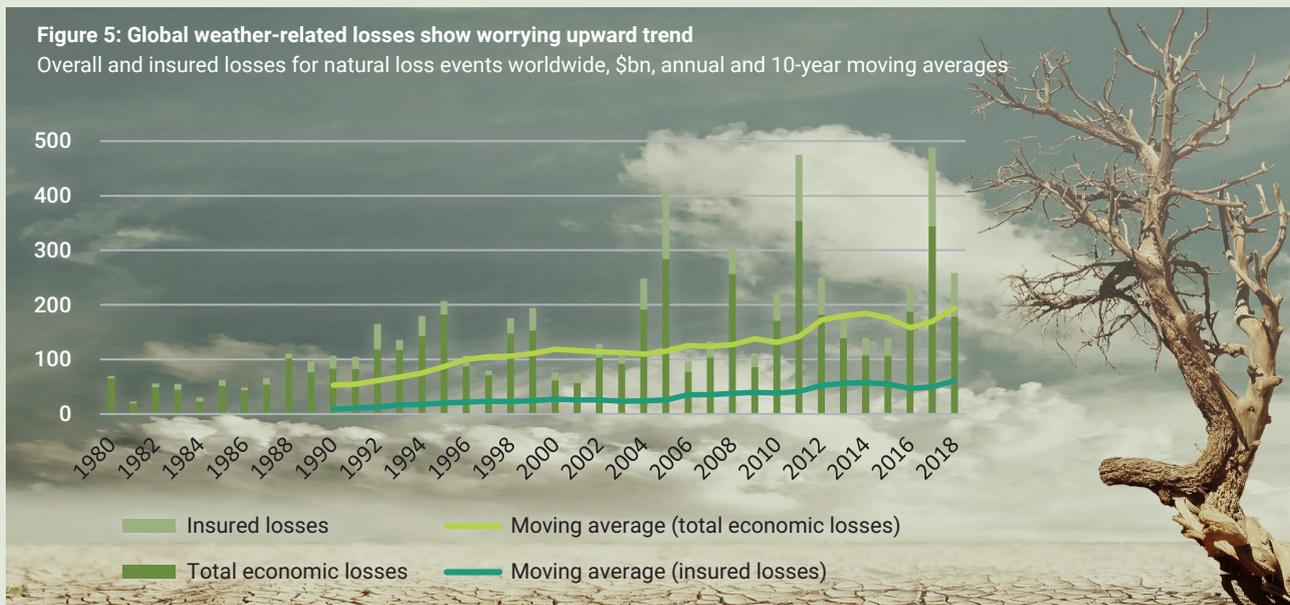
Climate-related risks translate to financial risks in at least three ways. First, through the manifestation of ‘physical risks’, such as the increased frequency of extreme weather events that may damage property and infrastructure and disrupt trade and economic activity. Gradual temperature changes could affect the value of assets. For the banking sector, these may be felt directly through the exposure of mortgage books to flood risk, or for globally active banks, through the impact of natural disasters on sovereign bond ratings and country risk.

Such costs are becoming visible as the frequency of natural disasters has increased dramatically. Around 850 natural loss events occurred in 2018 including floods, tropical cyclones, wildfires and earthquakes in the US, Japan and elsewhere, incurring a total cost of \$160bn, according to MunichRE’s NatCatService.

Second, there are liability risks for parties that have suffered losses from the effects of climate change and seek compensation from those they hold responsible. Weather-related insurance losses have increased almost five-fold to an average of around \$50bn per annum so far this decade from an average of around \$10bn per annum in the 1980s (see Figure 5). Meanwhile, the global insurance protection gap remains sizeable. The uncertainty associated with climate scenario analysis complicates the challenge of modelling implications for insurers’ liabilities.

Households and businesses will be affected too, as they could face more expensive or more curtailed insurance policies. In 2016, the insurance industry launched the Sustainable Insurance Forum, a network of 23 insurance regulators sharing knowledge and best practice on how to consider climate risk in insurance supervision. De Nederlandsche Bank hosted in April 2018 the first ever International Climate Risk Conference for supervisors.

Third, there are transition risks as households, businesses and industry sectors face costs, valuation losses and disruptions from the adjustment to a low-carbon economy. These risks are longer-term and less visible, and have yet to materialise. As such, they may not carry a strong sense of urgency.



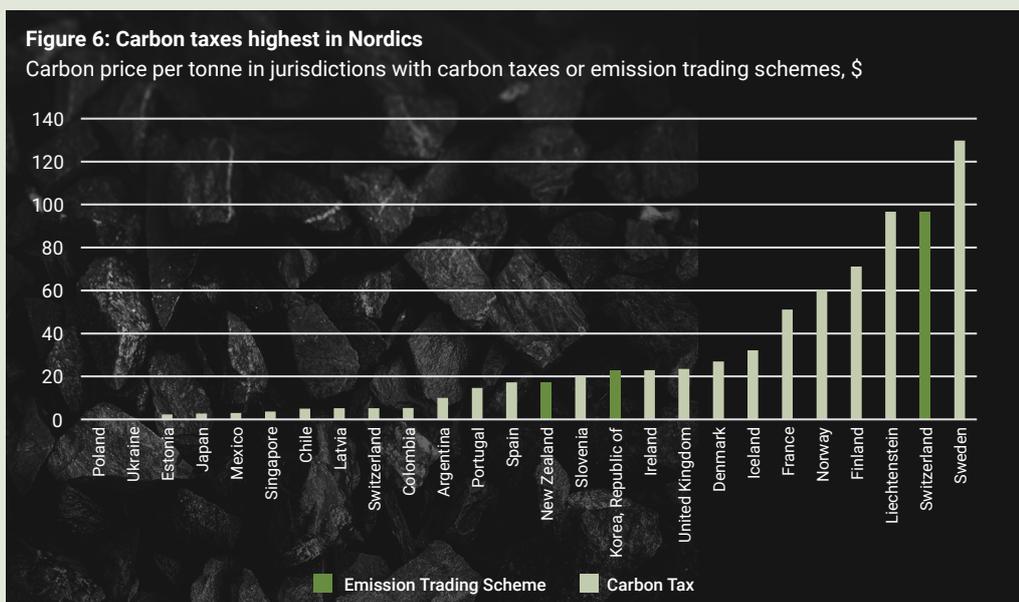
Source: MunichRe NatCatSERVICE database, OMFIF analysis

However, inaction will come at a high price. The more sudden and disorderly the transition, the greater the costs. Signatories to the Paris climate agreement have committed to reduce carbon emissions by 45% from 2010 levels over the next decade to reach net zero by 2050. Meanwhile, the EU has committed to a 40% reduction in emissions by 2030 compared with 1990 levels and to attaining carbon neutrality by 2050.

Governments are already taking action, by introducing carbon taxes and emissions trading schemes to help 'internalise the externality' of excessive carbon emissions. Carbon taxes are

highest in Sweden, at close to \$130 per tonne, with Norway and Finland also pricing carbon high at above \$50 per tonne. This compares with taxes below \$20 per tonne for non-European jurisdictions that have implemented carbon taxes or emissions trading schemes (see Figure 6).

As such initiatives take hold, their impact is not only felt in the atmosphere but also on financial markets. For example, the combined market capitalisation of the top four US coal producers has fallen by 95% since the end of 2010. A similar change has occurred in German utility firms hit by changes in domestic energy policies, including the phasing



Source: World Bank Carbon Pricing Dashboard, OMFIF analysis

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We invest in green because we see it as a driver of long-term value, in addition to wanting to do the right thing.

Norman Chan, Chief Executive, Hong Kong Monetary Authority

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We should not be obliged to promote green finance by granting banks preferential capital treatment if this is not justified by the specific risks linked to green finance.

Sabine Lautenschläger, member of the ECB executive board

out of nuclear energy and the move to renewables.

Meeting the Paris targets will require a substantial reallocation of capital. Some of the transition will happen in existing firms and industries, and the rest through new firms and new industries unburdened by legacy assets and technologies. As remarked by Central Bank of Ireland Governor Philip Lane, 'The balance between these two forces will be crucial in determining the balance between debt and equity in financing the transition, since start-ups naturally require more equity finance than incumbent firms'.

Irrespective of the level of public subsidies directed at supporting new sectors and products, households will have to bear at least some of the costs of the transition, such as retrofitting homes to reduce energy consumption, or higher spending on transportation as the balance shifts from private cars to other types of transport.

While their individual impacts will be significant, the three types of risk (physical, liability and transition) are linked. A smoother and more predictable transition path would help minimise transition risks to financial stability. But a slower transition could increase the likelihood of physical and liability costs. Conversely, too rapid a transition, while necessary to limit the likelihood of physical and liability risk, may not be desirable either. As Bank of England Governor Mark Carney remarked, 'success is failure' in that scenario, as too rapid a movement towards a low-carbon economy could risk creating a 'climate Minsky moment' and materially damage financial stability. The analytical work to develop an understanding of the trade-offs and the desirable path forward is crucial.

### Supervising climate risk

To address these risks, central banks and supervisors are recognising the need for micro- and macroprudential instruments. The ECB this year identified formally climate-related risks as one of the key threats facing the banking sector. Bank of Finland Governor Olli Rehn recognised that, 'Correct pricing and supervision of financial risks stemming from climate change and other environmental hazards are needed, both for sustainable economic development and a well-functioning financial system'.

The first step in supervising such risks is to understand their size and likelihood. Regulators recognise the need for identification and disclosure of exposures in the financial sector, what can be considered a 'snapshot' of risks. So far, 250 companies representing \$6.5tn in market capitalisation and financial institutions (banks, insurers, asset managers) and responsible for

\$80tn of assets have committed to apply the recommendations on disclosures by the Task Force for Climate-Related Financial Disclosures.

At the same time, dynamic, forward-looking carbon stress tests, so-called 'videos of risks', are needed to ascertain the size of probable losses of financial institutions' portfolios, with firms setting out the resilience of their strategy in different climate-related scenarios.

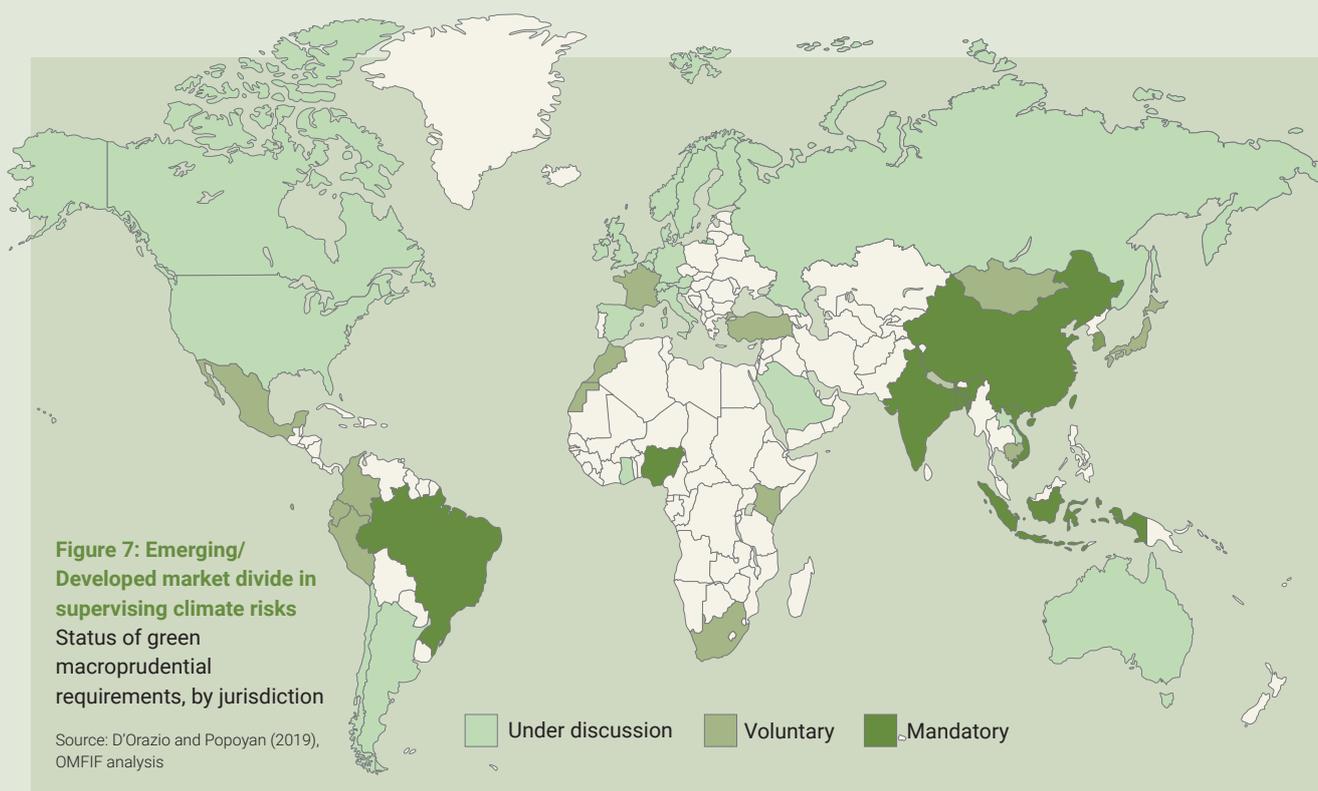
But while there is broad agreement among regulators on the need to develop taxonomies, enable disclosures, and monitor risks through rigorous scenario analysis and stress testing, there is less harmony when it comes to views on how to address these through microprudential and macroprudential regulation.

The need for macroprudential regulation follows the recognition that losses from certain climate-related scenarios could lead to declines in the capital and solvency ratios tracked by prudential regulators. These stem from market risks and credit risks, as well as structural changes and uncertainty associated with climate change. The optimal allocation and risk management strategies in the design of equity and bond portfolios may have to be reassessed.

One way of correcting the misalignment between current regulation and the need to transition to a low-carbon economy would be to enhance governance frameworks such as Basel III to ensure they reflect climate-related financial risk concerns. This would involve strengthening capital and liquidity requirements such as the liquidity coverage ratio, the net stable funding ratio, the leverage ratio, and capital and countercyclical capital buffers. In addition, it would require bolstering the supervisory elements of Basel III by adding climate-related stress tests, and reinforcing risk disclosure and market discipline.

Reviewing macroprudential tools in more detail, these can be categorised in those relating to capital, lending limits, liquidity and reserves. The first could take the form of countercyclical capital buffers, sectoral leverage ratios, or capital adequacy ratios with 'green supporting factor' or 'brown penalising factor'. The People's Bank of China already deploys a GSF, used to incentivise the presence of green loans in banks' portfolios. However, European central bankers are sceptical, highlighting that 'green does not mean risk-free,' (François Villeroy de Galhau) and that 'such risks cannot be disregarded without jeopardising financial stability' (Olli Rehn). Substantial further evidence is needed to create a strong enough rationale for such policies.

Lending limits can take the form of maximum



credit ceilings or minimum credit floors. In the case of liquidity, instruments range from liquidity coverage ratios to net stable funding ratios. Finally, there can be differentiated reserve requirements.

There is a great variety of green prudential instruments, but a clear divide between emerging and advanced economies. Lending limits are the most popular instrument, and are mandatory in Bangladesh, India, Nigeria, Brazil, Laos, Vietnam and Korea. They are under discussion in Denmark, Ecuador, Japan and Kenya. Climate-related stress tests are obligatory only in China, and under consideration in France and the Netherlands. Risk disclosure and risk assessment are under discussion in Colombia, Indonesia, Pakistan, Peru, South Africa, Switzerland and Turkey (see Figure 7).

#### Climate change and monetary policy

While their mandates tend to focus on the medium-term inflation outlook, central banks consider routinely the policy implications of long-term events such as demographic and technological shifts and their effects on labour force participation and the broader macroeconomy. Climate change poses similar challenges in terms of the uncertainty associated with its repercussions on monetary policy, but it displays a distinctive set of characteristics that sets it apart from other types of shifts.

First, it is far-reaching in breadth and scope, affecting all agents across different geographies

and sections of the economy. Second, climate risks are foreseeable. While there is a high degree of uncertainty regarding their nature, this is no excuse for inaction. It is clear that some combination of physical and transition risk will materialise eventually. As ECB Executive Board Member Sabine Lautenschläger remarked, ‘Climate change will not adapt to our research schedules’. Third, climate change is effectively irreversible; there is no technology available to undo the concentration of greenhouse gas emissions in the atmosphere. And, finally, shifts related to climate change are distinctive in that they are endogenous. Their future magnitude and likelihood depend on the actions of today. As Villeroy de Galhau remarked in April 2018, ‘It is delusional to think that when risks become perceptible, everyone will be able to cut their exposures at the same time and in an orderly fashion.’

With regard to monetary policy, the impact of climate change will be felt most directly through the physical risk channel. The increase in the frequency and severity of weather shocks is likely to raise the volatility of inflation, sectoral relative price levels, and output.

When met with such negative supply-side shocks, central banks will generally face a trade-off forcing them to prioritise stable prices over output. Left unchecked, climate change can complicate further the identification of shocks relevant for the medium-term inflation outlook and make the occurrence of

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While the effects and risks of climate change are relevant factors for the Federal Reserve to consider, it is not in a position to use monetary policy actively to foster a transition to a low-carbon economy.

Glenn Rudebusch, executive vice-president of the economic research department at the Federal Reserve Bank of San Francisco

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### Green quantitative easing

Central bankers are hesitant to integrate climate considerations into their unconventional monetary operations. Their growing interest in the climate change agenda has encouraged calls for 'green quantitative easing'. This would involve suspending asset purchases in high-carbon sectors and instead favouring bonds which fund green projects. But central bankers have expressed concern over how such a practice could undermine the instruments' effectiveness.

At the same time, the NGFS acknowledged in its first progress report in October 2018 that 'climate- or environmental-related criteria are not yet sufficiently

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**The asset purchasing programme is a tool for macroeconomic stabilisation, not microeconomic reallocation.**

**Yves Mersch,  
Member of the ECB  
Executive Board**

accounted for in internal credit assessments or in the models of credit agencies' which many central banks rely on for their operations. Olli Rehn, then-deputy governor of the Bank of Finland, remarked in June 2018 that 'Sustainability considerations should be better reflected in the key tools for decision-making by market actors and policy-makers, such as benchmarks and credit ratings.' This reveals an uncomfortable contradiction for central

banks like the ECB which, as a member of the NGFS, is seen as admitting that risk is accounted for improperly in the current ratings system while at the same time using that system to decide which assets to buy in its asset purchase programme.

Still, while there is no explicit environmental target in the ECB's APP, the bank has purchased green bonds both under the corporate sector and public sector purchase programmes. It holds around a quarter of eligible publicly-issued green bonds and around a fifth of private sector green bonds, in line with the share of holdings across the totality of its programme-eligible bonds.

Other central banks may be simply prohibited from even considering green QE as an option. According to Glenn Rudebusch, executive vice-president at the economic research department of the Federal Reserve Bank of San Francisco, 'Green quantitative easing is an option for some central banks but not for the Fed, which by law can only purchase government or government agency debt'. While sovereign green bonds have been issued, these represent a very small asset category,

such trade-offs more frequent. Moreover, climate change will probably spark structural shifts that will impact the underlying path of potential output – a crucial variable for monetary policy-making.

Through the transition risk channel, the economic transformation required to address the climate change challenge will involve a shift in relative prices, especially in energy prices. This could risk destabilising medium-term inflation expectations. Such changes should not only be considered as part of the long-term horizon framework. Prices, equities and long-term financial asset valuations will also depend on expected future conditions, so even climate risks decades away can have near-term financial consequences.

Central banks have been reluctant to acknowledge the link between climate change and monetary policy. The April 2019 NGFS comprehensive report only went as far as stating that the Network 'considers exploring the interaction between climate change and central banks' mandates (beyond financial stability) and the effects of climate-related risks on the monetary policy frameworks, paying due regard to their respective legal mandates.' Among NGFS members, only one central bank, the People's Bank of China, has a dedicated policy to promote green finance via monetary policy. François Villeroy de Galhau, one of the central bankers leading this agenda, remarked that 'Monetary policy has to remain neutral to ensure proper functioning through its transmission channels; it cannot be targeted towards achieving specific social or sectoral impacts.'

At a time when central bank independence is under attack over unconventional monetary policies, this scepticism may reflect unwillingness to take on an agenda that may be interpreted as political. In a speech on climate change and central banking in November 2018, Yves Mersch, executive board member at the ECB, warned that 'The bigger threat to price stability over the long run does not lie in relative price changes, but rather in a loss of independence by central banks following a situation in which they have ventured far into a political agenda with distributional consequences.'

#### Financing the climate transition

Tasked with safeguarding financial and price stability, central bankers tend to focus on the risks that climate change poses. But when it comes to reserves management, climate change presents investment opportunities for central banks and other global public investors.

According to the OECD, a \$90tn investment is needed by 2030 to finance the green transition. This is to promote the development of technologies such as carbon capture and storage, and electricity generation from renewable sources. A separate study by the IPCC from October 2018 estimates that the world needs to spend \$900bn annually

until 2050 on energy-related mitigation investments to limit global warming to 1.5 degrees. The European Commission estimates that €180bn are required over 2021-30. Should these figures not be met, the so-called 'climate debt', as referred to by Rehn, will accumulate. Public investment can address such needs. For example, the European Fund for Strategic Investments has a mandate to invest 40% of its €500bn capacity in green investments. Most of the adjustment costs, however, will fall on the private sector.

The green finance market has grown rapidly in the past decade. The European Investment Bank issued the world's first green bond in 2007. Since then, the global climate-aligned bonds market has swelled to \$1.45tn in 2018, according to the Climate Bonds Initiative. Last year, around \$168bn worth of green bonds were issued, compared with \$162bn in 2017.

This market also includes sovereign green and blue bonds. Poland issued the first sovereign green bond in 2016, followed by France, Fiji and Nigeria in 2017. Belgium, Indonesia, Lithuania and Ireland followed in 2018. That year, the Seychelles launched the world's first sovereign blue bond, a pioneering financial instrument designed to support sustainable marine and fisheries projects.

However, green bonds represent a minuscule share of the overall fixed income market, accounting for less than 2% of global debt issuance. This suggests that green bonds need to be scaled by a factor of at least 10 to provide the required investment in renewable energy, energy efficiency and low-emission vehicles. Moreover, sources of finance must be extended beyond green bonds to products such as green loans, securitisation, covered bonds, derivatives, crowdfunding platforms and private equity. The success of the climate transition depends on it.

Investors, including GPIs, are moving to

sustainable exchange-traded funds and exchange-traded products. These are reaching record levels having grown six-fold to 210 in 2019 from just 39 in 2009. Assets invested in these funds and platforms have reached a record level of \$25bn from around \$5bn in 2009 (see Figure 8).

However, policy-makers and the financial sector are also becoming aware increasingly of the trade-offs between the rapid expansion in the sector, and the need to maintain rigorous standards and avoid so-called 'greenwashing'. Patrick Njoroge, governor of the Central Bank of Kenya, speaking on the role of the Nairobi Stock Exchange as a green finance hub, warned, 'We cannot accept, or afford, to give cover to those who only wish to burnish their greenwashing credentials'.

#### Greening reserve portfolios

Central banks are attempting to act on their climate rhetoric by integrating sustainability criteria into their operations and portfolio management, with the euro area leading the charge. For example, the Central Bank of Ireland designed its new headquarters to be energy efficient. The bank's governor, Philip Lane, has called on the central banking community to make greater use of communications technologies to cut down on travel to international meetings.

Meanwhile, the Banque de France in March 2018 adopted a responsible investment charter to 'improve the contribution of own funds and pensions portfolios to the environmental transition.' In April 2019, it announced to plans to disclose the climate-risk exposures of its funds and pension portfolios, the first central bank to do so. The ECB has worked to foster sustainable investment in its non-monetary policy portfolios including its pension fund, which has delegated proxy voting for equity investment to managers that have signed up to the principles for responsible investment.

In addition to pension portfolios, as long-term investors, central banks have an important role to play in the development of green finance through their investment portfolios and reserve allocation. Norman Chan, chief executive of the Hong Kong Monetary Authority, speaking at the 2018 green and social bond principles annual conference, said, 'As a long-term investor, HKMA considers risk and return over a long horizon. We believe looking at an investment proposal through the ESG lens would complement our normal risk-return analysis, and help unveil the long-term value and risk of an investment'.

The Central Bank of Ireland also takes ESG criteria into account when managing its portfolio. The equities component of its portfolio is

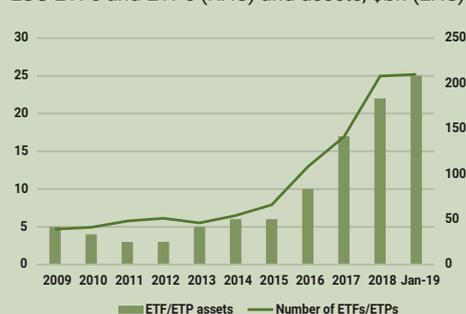
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The transition path poses challenges, but also opportunities. Particular industries and communities are exposed to the costs of changes in the climate while others may benefit from that transition. But it may not be possible for the winners to compensate the losers in a way that leaves no one worse off.

Guy Debelle, Deputy Governor of the Reserve Bank of Australia

**Figure 8: Assets invested in ESG ETFs and ETPs at record high**

ESG ETFs and ETPs (RHS) and assets, \$bn (LHS)



Source: ETFGI, OMFIF analysis

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managed in line with the PRI as well as with the World Health Organisation’s framework convention on tobacco control. It is preparing an ESG policy for its bond portfolio, which already includes 10 green bonds valued at €221m. In January 2019, De Nederlandsche Bank signed the UN PRI and adopted a responsible investment charter. Suomen Pankki - Finlands Bank has also applied responsible investment standards to its portfolio management.

However, not all central bank reserves management practices match the climate agenda’s strong momentum. Less than half of central banks responding to the 2019 OMFIF GPI survey reported they were investing part of their reserves in green or sustainable assets. This compares with almost all pension funds and sovereign funds we surveyed.

Often, central banks are more constrained than other types of GPIs in terms of what asset classes they are eligible to purchase. Several central banks also cited lack of supply, remarking that ‘in our investment universe there is a limited supply of green bonds.’ Others referred to the inability of sustainable assets to meet their liquidity and maturity thresholds. One central bank stated that ‘very long durations of green bonds are problematic when our bond duration is very short.’

Conservatism and difficulty convincing internal stakeholders were also mentioned as barriers to investing in sustainable assets. Nevertheless, one central bank remarked that ‘current mandates and available assets in which to invest restrict opportunities... but we are seeking to change our mandates to open up the green investment universe.’

Among central banks in our sample which do not currently invest in green or sustainable assets, a third are prevented by their mandate from doing so. A further third highlighted wider issues with sustainability criteria and lack of data, and with the transparency and accountability of company data.

ESG criteria are gaining importance when it comes to outsourcing portfolios to external managers. Most pension and sovereign funds consider ESG criteria as ‘important’ or ‘very important’ with regards to guidelines to external managers, compared with just a quarter for central banks. This can take the form of divestments as well as active investments in green assets, as explored in the special report on sustainable investment in last year’s Global Public Investor.

The world’s largest sovereign fund (and fourth-largest GPI in our ranking), Norway’s \$1tn Norges Bank Investment Management, this year decided to sell some of its holdings in energy companies that explore for and produce oil and gas. This entailed the exclusion of 150 oil and gas exploration companies,

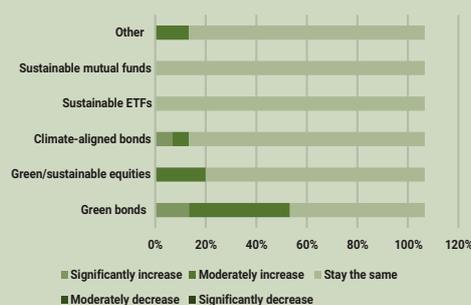
worth €7.5bn. However, the fund opted to retain stakes in fossil fuel companies involved in renewable energy, such as Shell and BP. This highlights the nuances behind the simplistic green/brown distinction. Investments in the brown sector may be more effective in facilitating the transition due to the scope of the benefits of switching.

When investing in green assets, green bonds are the dominant instrument for GPIs. They were chosen by 79% of those surveyed who invested in green assets. Within the same sample, 11% purchased climate-aligned bonds and 42% invested in green equities. Still, these allocations represent a small share of GPIs’ overall portfolios, with green equities representing around 37% of all equity investments and green bonds representing around 16% of all bonds.

Looking ahead, around 60% of GPIs surveyed by OMFIF stated that they plan to ‘increase’ or ‘significantly increase’ their green investments. Green bonds were the most popular option, with 53% of respondents planning to ‘increase’ or ‘significantly increase’ their exposure to the asset class, compared with 13% for climate-aligned bonds and 20% for green and sustainable equities (see Figure 9).

**Figure 9: Green bonds continue to dominate sustainable asset market**

How do you plan to change your allocation to the following assets in the next 12-24 months? % of responses by asset type



Source: OMFIF GPI Survey 2019

### Limits of central banks

Central banks are serious about climate change. They are making commendable strides to adapt regulation and supervision practices to guard against risks and facilitate the transition to a low-carbon economy. But these initiatives are not enough, nor can they be a substitute for an ambitious climate agenda led by governments, businesses and individuals. Many players acting together will be essential for the future. ✦

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The systematic oversubscription of green bonds at issuance shows there is a lack of green financial products.

François Villeroy de Galhau, Governor, Banque de France

## Key sustainable investment developments involving public institutions in 2018-19

Institution	Description	Date
<b>Network of Central Banks and Supervisors for Greening the Financial System</b>	The NGFS, which was set up in December 2017 by the Banque de France with eight members, published its first comprehensive report in April 2019, building on its first progress report from October. As of April it has 36 members.	April 2019
<b>Norges Bank Investment Management</b>	Norway's sovereign fund excluded 150 oil and gas exploration and production companies, worth €7.5bn, from its \$1.1tn portfolio. However, the Fund said it would retain stakes in fossil fuel companies involved in renewable energy.	March 2019
<b>Dutch National Bank</b>	The DNB became the first central bank to sign the United Nations' principles for responsible investment. It launched a responsible investment charter, and committed to incorporating six ESG criteria in its investment practices.	March 2019
<b>Första AP-fonden</b>	Swedish pension fund AP1 divested from nuclear weapons, tobacco, coal and oil sands industries following the introduction of new investment guidelines.	January 2019
<b>ABP</b>	Europe's largest pension fund, Dutch ABP, completed its divestment of €4bn in nuclear arms manufacturers and tobacco producers in 2018, making a 20% (€700m) profit.	January 2019
<b>European Bank for Reconstruction and Development</b>	The EBRD approved plans for a €250m direct investment framework for green and sustainability bonds targeted at financial institutions.	December 2018
<b>Republic of Seychelles</b>	Seychelles launched the world's first sovereign blue bond, a pioneering financial instrument designed to support sustainable marine and fisheries projects.	October 2018
<b>National Treasure Management Agency</b>	Ireland's NTMA issued the country's first sovereign green bond, a 12-year bond raising €3bn.	October 2018
<b>UK pension funds</b>	The UK Department for Work and Pensions introduced new regulations for pension funds, to come into effect in October 2019. These require trustees to disclose how much they take into account ESG factors when making investment decisions.	September 2018
<b>World Bank Group, European Investment Bank, Amundi and others</b>	The Global Green Bond Partnership was set up to support efforts by sub-national entities such as cities, regions, private companies and financial institutions to accelerate the issuance of green bonds.	September 2018
<b>United Nations</b>	The UN Environment Programme Finance Initiative set up the tobacco-free finance pledge to encourage divestments from tobacco. Those who have signed up to the pledge include Sweden's AP4 and the Ontario Teachers' Pension Plan.	September 2018
<b>European Investment Bank</b>	The EIB raised €500m from a 7.5-year sustainability awareness bond whose proceeds will be used to finance investments in clean water supply, sanitation and flood protection.	September 2018
<b>Government Pension Investment Fund</b>	Japan's \$1.4tn pension fund – the world's largest – selected two of its carbon-friendly indices as the benchmark for its ESG strategy: the S&P Global Ex-Japan LargeMidCap Carbon Efficient Index and the S&P/JPX Carbon Efficient Index.	September 2018
<b>California pension funds</b>	The US senate passed Bill No.964 requiring Calpers and Calstrs to report publicly on the climate-related financial risk of their public market portfolio from 2020.	August 2018
<b>European Commission</b>	The technical expert group on sustainable finance started developing a green taxonomy, EU green bond standards and benchmarks for low-carbon investment strategies.	July 2018
<b>Republic of Lithuania</b>	Lithuania became the seventh country to issue a sovereign green bond, raising €68m with a 10-year deal. Proceeds are aimed at improving energy efficiency in residential properties.	June 2018