THE GREEN CENTRAL BANKING SCORECARD

HOW GREEN ARE G20 CENTRAL BANKS AND FINANCIAL SUPERVISORS?

PositiveMoney

Published March 2021

ACKNOWLEDGEMENTS
We would like to thank the European Climate Foundation for generously funding this project and Hilal Atici (The Sunrise Project) for providing guidance and feedback throughout. We are also grateful to Paul Schreiber (Reclaim Finance), Katie Kedward (UCL Institute for Innovation and Public Purpose), Lukasz Krebel (New Economics Foundation), Frank van Lerven (New Economics Foundation), Prashant Vaze (Climate Bonds Initiative), Neha Kumar (Climate Bonds Initiative), Danae Kyriakopoulou (Official Monetary and Financial Institutions Forum), Ulrich Volz (SOAS Centre for Sustainable Finance), Mathias Lund Larsen (International Institute of Green Finance), Dileimy Orozco (E3G), Jens van't Klooster (KU Leuven), Louison Cahen-Fourot (Vienna University of Economics and Business), Gyorgy Dallos (Greenpeace International), Jamie Sawyer (Client Earth), James Vaccaro (RePattern), Pierre Monnin (Council on Economic Policies), Paola D'Orazio (Ruhr-Universität Bochum), Uuriintuya Batsaikhan (Positive Money EU), Stan Jourdan (Positive Money EU), Fran Boait (Positive Money UK) and Simon Youel (Positive Money UK) for the valuable contributions and feedback they provided at various stages of this project.

AUTHORS
David Barmes (lead), Zack Livingstone

SUGGESTED CITATION
David Barmes and Zack Livingstone (2021). The Green Central Banking Scorecard: How Green Are G20 Central Banks And Financial Supervisors? Positive Money.
Available at: https://positivemoney.org/publications/green-central-banking-scorecard/

Endorsements

The following organisations have expressed their support for the key messages of the Green Central Banking Scorecard. These organisations endorse the contents of this report as a whole, but not necessarily every score awarded to every country.

Executive Summary

Central banks and financial supervisors have a duty to incorporate environmental considerations into their policymaking. Failing to do so jeopardises their ability to fulfill their mandates and reduces our chances of tackling climate and ecological breakdown. Increased risk of pandemics like COVID-19, generated by our global economic system's destruction of nature, strengthens the case for action.

This report reviews the full range of policies and initiatives that an ideal green central bank would adopt across four categories: *Research and Advocacy*, *Monetary Policy*, *Financial Policy*, and *Leading by Example*. Based on this literature review, expert consultation, and bilateral interactions with central bankers and supervisors, we develop a system to score and rank G20 countries on the green policies and initiatives of their monetary and prudential authorities.

Our results, displayed as a 'scorecard' below, show that actions are failing to match up with words, as the vast majority of countries score full marks in *Research and Advocacy* while performing poorly across the other three categories. While some institutions have taken concrete action to assess environmental risks and incentivise green investments, all are shying away from policies that disincentivise or restrict financial flows to environmentally harmful activities.

We identify the alignment of monetary and financial policies with environmental targets as key priorities moving forward. High impact policies that would achieve this include the exclusion of fossil fuels from asset purchase programmes and collateral frameworks, and the adjustment of prudential tools such as risk weights to effectively integrate the risk of high-carbon lending.

GREEN CENTRAL BANKING SCORECARD - RESULTS

G20 countries ranked by green monetary and financial policies

Rank	Country	Research and Advocacy *(out of 10)*	Monetary Policy *(out of 50)*	Financial Policy *(out of 50)*	Leading by Example *(out of 20)*	Aggregate Score (out of 130)	Grade (A+ to F)
1	China	10	16	24	0	50	C
2	Brazil	10	16	18	1	45	C-
3	France	10	3	22	8	43	C-
4	United Kingdom	10	4	19	5	38	D+
5	European Union	10	2	15	6	33	D+
6	Italy	10	2	15	4	31	D+
7	Germany	10	1	15	3	29	D
8	Indonesia	10	1	8	2	21	D
9	Japan	10	5	4	0	19	D-
10	Australia	10	0	4	1	15	D-
11=	Canada	10	0	2	1	13	D-
11=	Mexico	10	1	1	1	13	D-
13=	South Korea	10	0	1	0	11	D-
13=	United States	10	0	1	0	11	D-
15	India	3	5	1	0	9	F
16	Russia	5	0	1	2	8	F
17	South Africa	7	0	0	0	7	F
18	Turkey	1	0	3	0	4	F
19=	Argentina	0	0	0	0	0	F
19=	Saudi Arabia	0	0	0	0	0	F

Contents

Introduction

COVID-19 is a symptom of our global economic system's relentless exploitation of nature.[2] Rather than responding to the current crisis in a way that supports the transition to a more sustainable and just society, central banks have propped up a financial system that is facilitating climate change, ecological destruction, and a higher risk of pandemics.[3]

To the extent that central banks and financial supervisors have taken environmental considerations into account in their policymaking activities, flawed theoretical assumptions have prevented them from going far enough. Focusing on climate-related financial disclosures and stress tests is severely deficient, and abiding by the mythical principle of 'market neutrality'[4] runs contrary to the goal of carbon neutrality. A failure to proactively implement high impact green policies will result in central banks and supervisors continuing to support a fossil fuel intensive and ecologically harmful financial system. Their mandates require them to change course, as protecting climate stability is a prerequisite to protecting price and financial stability. Some central banks are even explicitly required to support environmental objectives, or support government policy priorities which often include such objectives.[5]

For the global economy to undertake a transition to a green financial system, monetary and financial policymaking must be fully aligned with sustainability objectives. This requires central banks and supervisory authorities to move beyond words and toward concrete action on the environmental agenda. While fiscal authorities, alongside other government departments, must play the leading role in averting the climate crisis, it is essential that central banks and supervisors also do their part. The green central banking scorecard featured in this report reveals the relative progress monetary and prudential authorities in G20 countries have made towards implementing green policy across their operations.

Section 1 reviews the arguments for including environmental objectives in monetary and prudential policy, and highlights how COVID-19 strengthens the case for a more proactive and interventionist role for central banks.

Section 2 unpacks how green monetary and financial policymaking works in practice, providing an overview of the policy options central banks and supervisors can implement to incorporate environmental considerations across their operations and policy decisions.

Section 3 details the methodological approach taken to create the scorecard, which was guided by bilateral consultation with civil society experts on green central bank policy, as well as the central banks and supervisors ranked on the scorecard. This is followed by the results of the scorecard, with a discussion of the key findings and overall implications for monetary and prudential policymakers, and the civil society organisations and academics calling for them to enact green policy.

We conclude with a review of the key points of each section, and offer closing comments on the call to action for central banks that the scorecard represents.

[1] Morens, David M, and Anthony S Fauci. "Emerging Pandemic Diseases: How We Got to COVID-19." Cell vol. 182,5 (2020): 1077-1092. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7428724/

[2] Laurie Macfarlane (7 January 2021). Why 2021 is humanity's make-or-break moment on climate breakdown. https://www.opendemocracy.net/en/oureconomy/why-2021-is-humanitys-make-or-break-moment-on-climate-breakdown/

[3] 'Dikau et al. (2020) find that "less than 1 percent of central banks and supervisors from 188 economies have directly connected their crisis response with sustainability factors": Dikau S, Robins N and Volz U (2020). A Toolbox of Sustainable Crisis Response Measures for Central Banks and Supervisors, Second Edition: Lessons from Practice. INSPIRE Briefing Paper. https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/11/INSPIRE-toolbox_-2nd-Edition-1.pdf

[4] See Box 1 on page 11 for an explanation of the concept of market neutrality.

[5] Dikau and Volz (2020) find that 12% of central banks in a sample of 135 have explicit environmental sustainability mandates, and an additional 40% are "mandated to support the government's policy priorities, which in most cases include sustainability goals": Simon Dikau, Ulrich Volz (January 2020). Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance. SOAS. https://www.soas.ac.uk/economics/research/workingpapers/file145514.pdf

Section 1: Why should central banks 'go green'?

The case for central banks to incorporate climate-related considerations into their decision making is stronger than ever. Following years of research and campaigning from civil society and academics, senior central bankers are increasingly expressing their support for moves in this direction.[6] The Network for Greening the Financial System (NGFS) has led the way in mobilising over 80 central banks and supervisors to share best practices on incorporating environmental considerations into their operations.[7] Remaining debates and disagreements revolve around the particular justifications for central bank action on climate, and the appropriate scope of policies and details of their implementation.

This section outlines the two overarching arguments developed by academics, civil society and central bankers to justify an expanded role for central banks in addressing climate and ecological breakdown, and explains how these arguments are strengthened by COVID-19.

1.1 Supporting government policy

A small portion of central banks—12% in the sample of 135 studied by Dikau and Volz (2020)—have explicit sustainability mandates that require them to take climate and environmental action. An additional 40% are "mandated to support the government's policy priorities, which in most cases include sustainability goals".[8] These broad mandates justify central banks taking active roles in tackling climate and ecological breakdown. In almost all cases, the pursuit of sustainability objectives is secondary to fulfilling price stability mandates. However, as evidenced in this report, the transition to a sustainable economy is a fundamental prerequisite of protecting financial and price stability.

The very concept of central banks pursuing narrow mandates is a relatively recent phenomenon.[9] From the mid-twentieth century up to the 1980s, various forms of credit guidance—policies aimed at steering the allocation of credit towards certain sectors over others—were commonly used by advanced economy central banks to support the industrial strategies of their governments,[10] and they remain common today in a number of emerging market economies, such as China, India, and Bangladesh.[11] There is a strong case for the widespread revival of such active coordination between central banks and governments across the globe in order to tackle the multiple crises we're facing.[12] While this may entail updating central bank mandates in some cases, coordination between monetary and fiscal authorities within a clear and transparent framework is consistent with the maintenance of central banks' operational independence.[13]

[6] See, for example:

Andrew Bailey (09 November 2020). Speech: "The time to push ahead on tackling climate change." https://www.bankofengland.co.uk/speech/2020/andrew-bailey-speech-corporation-of-london-green-horizon-summit; Isabel Schnabel (28 September 2020). Speech: "When markets fail – the need for collective action in tackling climate change."https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200928_1~268b0b672f.en.html;

François Villeroy de Galhau (11 February 2021). Speech: "The role of central banks in the greening of the economy." https://www.banque-france.fr/en/intervention/role-central-banks-greening-economy; Klaas Knot (11 February 2021). "Getting the Green Deal done: how to mobilize sustainable finance." Der NederlandscheBank. https://www.dnb.nl/publicaties/publicaties-dnb/speeches/speech-klaas-knot-getting-the-green-deal-done-how-to-mobilize-sustainable-finance/

[7] NGFS First Progress Report October 2018. https://www.ngfs.net/sites/default/files/medias/documents/818366-ngfs-first-progress-report-20181011.pdf;

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

https://www.ngfs.net/sites/default/files/medias/documents/ngfs_first_comprehensive_report_-_17042019_0.pdf; NGFS (March 2020). Annual report 2019.

https://www.ngfs.net/sites/default/files/medias/documents/ngfs_annual_report_2019.pdf

[8] Simon Dikau, Ulrich Volz (January 2020). Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance. SOAS.

https://www.soas.ac.uk/economics/research/workingpapers/file145514.pdf

[9] Benjamin Braun and Leah Downey (January 2020). Against Amnesia: Re-Imagining Central Banking. CEP. https://www.cepweb.org/wp-content/uploads/2020/01/CEP-DN-Against-Amnesia.-Re-Imagining-Central-Banking.pdf

[10] Bezemer, D., Ryan-Collins, J., van Lerven, F. and Zhang, L. (2018). Credit where it's due: A historical, theoretical and empirical review of credit guidance policies in the 20th century. UCL Institute for Innovation and Public Purpose Working Paper Series (IIPP WP 2018-11). https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2018-11_credit_where_its_due.pdf

[11] Bangladesh recently implemented a policy that requires 2% of loans issued by the country's banks to be allocated to green projects and 15% more widely to 'sustainable' projects: Syful Islam (January 14 2021). "Bangladesh mandates 2% of loans issued must be for green projects." PV Magazine.

https://www.pv-magazine.com/2021/01/14/bangladesh-mandates-2-of-loans-issued-must-be-for-green-projects/

[12] Benjamin Braun and Leah Downey (January 2020). Against Amnesia: Re-Imagining Central Banking. CEP.

https://www.cepweb.org/wp-content/uploads/2020/01/CEP-DN-Against-Amnesia.-Re-Imagining-Central-Banking.pdf; Josh Ryan-Collins (26 May 2020). "Central banks must change course if they are to lead us out of the coronavirus crisis." The Guardian.

https://www.theguardian.com/commentisfree/2020/may/26/banks-uk-recover-coronavirus

[13] Rob Macquarie, Fran Boait, David Clarke (2019). Seeking Legitimacy: A new settlement for the Bank of England.

http://positivemoney.org/wp-content/uploads/2019/10/Positive-Money-Seeking-Legitimacy.pdf

In the face of the existential threat posed by climate and ecological breakdown, all public institutions should enact proactive green policies that move our economic systems towards sustainability and climate justice.

1.2 Protecting price and financial stability

Even if central banks maintain narrow mandates that exclude sustainability, there is an alternative, equally important argument for them to take action on climate and ecological breakdown. In fulfilling their primary mandates of price and often financial stability, central banks identify and monitor potential risks that could jeopardise the achievement of their goals. Climate change and ecological breakdown are major sources of such risks, and are therefore of clear relevance to central bank operations.

Central bankers are increasingly recognising the threat climate change poses to both price stability[14] and financial stability.[15] Climate change is a source of two main types of financial risk: (i) physical risks, which arise from the increased frequency and severity of floods, storms, droughts and other extreme weather events, as well as long-term changes in climate patterns; and (ii) transition risks, which result from sudden changes in policy, technology, consumption and social norms.[16] Although there is a trade-off between physical and transition risks, in an ideal scenario, policymakers would design policy that ensures a relatively smooth transition to a sustainable economy, mitigating both types of risk.[17] If we fail to take action and continue with business as usual, allowing carbon-intensive activity to persist and the climate to continue warming, physical risks will grow exponentially and their materialisation will generate devastating consequences for society. Strong climate policies that come far too late would generate a disorderly transition, resulting in higher levels of both physical and transition risks.[18]

'Nature-related' financial risks, meaning those generated by other environmental threats such as biodiversity loss and soil depletion, are also relevant to the financial stability mandates of central banks and financial regulators.[19] According to the De Nederlandsche Bank (DNB)[20]—one of the few central banks that has engaged with nature-related financial risks—a third of assets in the Dutch financial sector are exposed to companies with high or very high dependency on one or more ecosystem services.[21] Ultimately, all economic activity is reliant in one way or another on the natural processes and ecosystems that create and support the conditions for life on earth.[22] While nature-related risks have thus far received too little attention from central banks, the NGFS has recognised their relevance and reviewed risk analysis practices by financial institutions.[23]

[14] See, for example, Christine Lagarde speaking on Washington Post Live (July 22, 2020):

https://www.washingtonpost.com/video/washington-post-live/christine-lagarde-on-the-ecb-pushing-for-a-green-bond-portfolio/2020/07/22/acf77359-1f47-4127-92bb-c4723f01ee0d_video.html; Isabel Schnabel (28 September 2020). Speech: "When markets fail – the need for collective action in tackling climate change." https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200928_1~268b0b672f.en.html; Frank Elderson (13 February 2021). Greening monetary policy. ECB. https://www.ecb.europa.eu/press/blog/date/2021/html/ecb.blog210213~7e26af8606.en.html

[15] See, for example, Margherita Giuzio et al: "Climate change and financial stability". Published as part of the ECB's Financial Stability Review, May 2019. https://www.ecb.europa.eu/pub/financial-stability/fsr/special/html/ecb.fsrart201905_1~47cf778cc1.en.html#toc1;
Reserve Bank of Australia - Financial Stability Review, October 2020. https://www.rba.gov.au/publications/fsr/2020/oct/pdf/financial-stability-review-2020-10.pdf;
Board of Governors of the Federal Reserve System - Financial Stability Report, November 2020. https://www.federalreserve.gov/publications/files/financial-stability-report-20201109.pdf

[16] Further types of risks have been identified, such as 'liability' and 'disruption' risks. For discussion of the latter, see: Thierry Philipponnat (June 2020). "Breaking the climate-finance doom loop: How banking prudential regulation can tackle the link between climate change and financial instability." Finance Watch. https://www.finance-watch.org/wp-content/uploads/2020/06/Breaking-the-climate-finance-doom-loop_Finance-Watch-report.pdf

[17] Physical risks from environmental breakdown are already materialising, with destructive impacts including human deaths, concentrated in countries that bear the least responsibility for the climate and ecological crises. A 2019 UN report, for example, found that a quarter of all premature deaths and diseases globally are caused by pollution and environmental damage:

UN Environment (2019). Global Environment Outlook – GEO-6: Healthy Planet, Healthy People. Nairobi. DOI 10.1017/9781108627146.
Available at: https://www.unep.org/resources/global-environment-outlook-6

[18] NGFS (June 2020). Guide to climate scenario analysis for central banks and supervisors.

https://www.ngfs.net/sites/default/files/medias/documents/ngfs_guide_scenario_analysis_final.pdf

[19] Kedward, K., Ryan-Collins, J. and Chenet, H. (2020). Managing nature-related financial risks: a precautionary policy approach for central banks and financial supervisors. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2020-09). https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/final_iipp-wp2020-09-kedward_et_al_nature-related_finance_edited_15_sept.pdf

[20] The central bank of the Netherlands.

[21] De Nederlandsche Bank (June 2020). Indebted to nature: Exploring biodiversity risks for the Dutch financial sector. https://www.pbl.nl/sites/default/files/downloads/4215-indebted_to_nature_-_exploring_biodiversity_risks_for_the_dutch_financial_sector_0.pdf

[22] Dasgupta, P. (2021), The Economics of Biodiversity: The Dasgupta Review. London: HM Treasury. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957291/Dasgupta_Review_-_Full_Report.pdf

[23] NGFS (September 2020) Overview of Environmental Risk Analysis by Financial Institutions. https://www.ngfs.net/sites/default/files/medias/documents/overview_of_environmental_risk_analysis_by_financial_institutions.pdf

Although awareness and understanding of environmental risks[24] is growing, generally central banks' approach to managing these risks—focused largely on risk disclosures and stress testing—tends to rely on two flawed theoretical assumptions: (i) environmental risks can be quantified; and (ii) financial markets are 'efficient'. While some central bankers have acknowledged severe climate-related market failures and argued in favour of fiscal policies to address them,[25] the same flawed assumptions nonetheless underpin the financial policies they often propose to manage environmental risks.

The first assumption—that environmental risks can be quantified—fundamentally misunderstands the nature of climate change and ecological breakdown. The concept of 'risk' describes an event that has a calculable probability of occurring, but events that are most likely to disrupt financial stability are characterised by 'radical uncertainty', meaning their likelihood of occurrence cannot be quantified.[26] Radical uncertainty prevents financial actors from forming rational valuations of assets. Environmental risks are clearly characterized by such uncertainty, given the complexity of the biosphere and the unpredictability of technological, social and political developments, and how these developments will affect the biosphere, which will in turn affect, in unpredictable ways, society and the financial system.[27]

This is related to the second flawed assumption that financial markets are 'efficient', which is based on a discredited theory of finance: the Efficient Markets Hypothesis (EMH). The EMH posits that all available information is reflected in asset prices, and that investors behave like rational actors forming perfectly accurate and identical evaluations of investments' risk-return profiles. Consequently, asset price changes result only from the arrival of new information and instances of financial instability can only be caused by external shocks. The EMH was effectively disowned by its originators, who claimed that "the empirical record of the model is poor—poor enough to invalidate the way it is used in applications" (Fama and French 2004).[28] Hyman Minsky's "Financial Instability Hypothesis",[29] which argues that financial instability arises recurrently from within the system itself, has proven a far better descriptor of the reality of financial dynamics.[30]

Relying on these two flawed assumptions has allowed central banks and supervisors to be concerningly passive in the face of environmental risks, hoping that as long as disclosure of these risks becomes widespread, markets will adjust to new information and financial institutions will self-regulate. In the UK, this approach and its underlying assumptions was recently challenged by a group of over 120 experts, arguing that a precautionary approach is necessary to manage climate risks and green the financial system.[31]

[24] The term 'environmental risks' refers to both climate and nature-related financial risks.

[25] Patrick Bolton et al. (January 2020). The green swan: Central banking and financial stability in the age of climate change. Bank for International Settlements (BIS).
https://www.bis.org/publ/othp31.pdf

[26] Mervyn King, John Kay (5 March 2020). Radical Uncertainty: Decision-making for an unknowable future. Book.

[27] Chenet,H.,Ryan-Collins, J. and van Lerven, F.(2019). Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2019-13).
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2019-13-climate-related-financial-policy-in-a-world-of-radical-undertainty-web.pdf; Kedward, K., Ryan-Collins, J. and Chenet, H. (2020). Managing nature-related financial risks: a precautionary policy approach for central banks and financial supervisors. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2020-09).
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/final_iipp-wp2020-09-kedward_et_al_nature-related_finance_edited_15_sept.pdf

[28] Fama, Eugene, F., and Kenneth R. French. (2004). "The Capital Asset Pricing Model: Theory and Evidence." Journal of Economic Perspectives, 18 (3): 25-46.
https://www.aeaweb.org/articles?id=10.1257/0895330042162430

[29] Hyman P. Minsky (May 1992). The Financial Instability Hypothesis. Levy Economics Institute Working Paper No. 74. http://www.levyinstitute.org/pubs/wp74.pdf

[30] See, for example: John Cassidy (28 January 2008). "The Minsky Moment." The New Yorker.
https://www.newyorker.com/magazine/2008/02/04/the-minsky-moment

[31] New Economics Foundation (19 November 2020). "Bank of England needs more powers to decarbonise economy, say experts."
https://neweconomics.org/2020/11/bank-of-england-needs-more-powers-to-decarbonise-economy-say-experts

Box 1: The myth of market neutrality

The concept of 'market neutrality' refers to central banks' efforts to minimise their impact on the relative prices of financial assets when conducting purchases of securities from the market. In practice, this means purchasing eligible assets in proportion to their market value. Central bankers, particularly in European countries, have frequently cited 'market neutrality' as a central principle in the implementation of monetary policy, and a reason for which central banks must not assist in steering financial flows from dirty to green assets.[32] However, it is increasingly clear that market neutrality is a myth that serves only to depoliticise inherently political asset purchase programmes, obfuscate the distributional implications of such programmes, and quell any calls for alternative approaches.[33]

In reality, as highlighted by Senni and Monnin (2020), "[a]ll along the monetary policy implementation process, central banks make choices which favour some assets more than others and thus shape relative prices, as well as relative funding conditions for firms".[34] From the very beginning of the policy process, monetary policymakers make a non-neutral choice in their selection of a particular tool that will influence firms' funding conditions in a particular way, and setting the parameters of use for any given tool involves multiple additional choices. For example, when a central bank engages in private sector asset purchases, it must decide which asset classes and investment vehicles it will purchase, which economic sectors will be eligible, and what levels of credit risk, issue sizes, and maturities it will accept.[35]

Thus far, the non-neutral choices of monetary policymakers have often been inconsistent with climate targets, as multiple private sector asset purchase schemes have been shown to contain significant biases towards carbon-intensive activities,[36] and collateral frameworks consistently fail to adequately account for environmental risks.[37] While many central bankers continue to hide the political nature of their decisions behind the mythical veil of market neutrality, others are gradually exploring its abandonment, partly in order to better incorporate environmental considerations into monetary policy operations. For example, as part of its strategic review, the European Central Bank (ECB) is questioning whether market neutrality is "the appropriate benchmark when the market by itself is not achieving efficient outcomes".[38]

[32] Yves Mersch (27 November 2018). Speech: "Climate change and central banking." ECB.
https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp181127.en.html; Jens Weidmann (23 November 2020). Speech: "Central banks should take adequate account of climate-related financial risks." https://www.bundesbank.de/en/tasks/topics/weidmann-central-banks-should-take-adequate-account-of-climate-related-financial-risks-851588

[33] Jens van 't Klooster & Clément Fontan (2020). The Myth of Market Neutrality: A Comparative Study of the European Central Bank's and the Swiss National Bank's Corporate Security Purchases, New Political Economy, 25:6, 865-879.
https://www.tandfonline.com/doi/full/10.1080/13563467.2019.1657077

[34] Chiara Colesanti Senni and Pierre Monnin (16 October 2020). Central Bank Market Neutrality is a Myth.
https://www.cepweb.org/central-bank-market-neutrality-is-a-myth/

[35] Ibid.

[36] David Barmes, Danisha Kazi and Simon Youel (July 2020). The Covid Corporate Financing Facility. Positive Money. http://positivemoney.org/wp-content/uploads/2020/07/CCFF-Final-version.pdf; Yannis Dafermos et al (October 2020). Decarbonising Is Easy: Beyond Market Neutrality In The ECB's Corporate QE
https://neweconomics.org/uploads/files/Decarbonising-is-easy.pdf; Yannis Dafermos et al (August 2020). Decarbonising The Bank Of England's Pandemic QE 'Perfectly Sensible'.
https://neweconomics.org/uploads/files/NEF-Decarbonise-BoE-report.pdf

[37] Antoine Oustry et al (December 2020). "Climate-related Risks and Central Banks' Collateral Policy: a Methodological Experiment." Working Paper 790. Banque de France.
https://publications.banque-france.fr/sites/default/files/medias/documents/wp-790_0.pdf

[38] Isabel Schnabel (28 September 2020). Speech: "When markets fail – the need for collective action in tackling climate change."
https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200928_1~268b0b672f.en.html

The precautionary approach—developed by Chenet et al. (2019)[39] and applied to nature-related financial risks by Kedward et al. (2020)[40]—articulates an alternative framework for financial policymaking in situations of unquantifiable uncertainty, where the consequences of inaction would be severe, such as environmental breakdown. Rather than waiting for better disclosures, data, and methodologies to resolve environmental risks, a precautionary approach requires taking immediate policy action through the use of discretionary instruments, as is currently already done within macroprudential policy to address other types of risks. Targeting the most high risk and environmentally harmful assets—such as those linked to fossil fuel extraction—for exclusion from monetary policy operations and limits or penalising factors in prudential policy would be an important first step in the implementation of a precautionary approach.[41] In the face of an existential threat characterised by radical uncertainty, this is the only responsible approach available to central banks and regulators.

In practice, central banks and financial regulators are already somewhat familiar with the precautionary approach. The 2007-08 financial crisis led to a recognition of the failures of pre-existing risk modelling and management approaches and ushered in a series of new policies—both prudential and monetary—were implemented to preventatively protect the financial system against uncertain systemic risks. As argued by Chenet et al. (2019), "regulatory innovations — in particular macroprudential policy, resolution planning and stress testing — can be seen as a shift in the direction of a precautionary approach [...] Post-crisis monetary policy has also taken a precautionary turn with liquidity easing policies enacted on a massive scale to avoid financial crisis and stimulate growth."[42] Now, central banks and regulators must apply such an approach specifically to the management of environmental risks.

1.3 The growing threat of pandemics

The root cause of pandemics is the very same root cause of the environmental crises we face today: our economy's destructive exploitation of nature.[43] Scientists have been warning that the widespread loss and degradation of natural ecosystems is increasing the probability of pandemics like COVID-19 in a wide range of ways.[44] For example, deforestation—a driver of climate change and biodiversity loss—generates animal migration and increases the likelihood of novel pathogens coming into contact with humans. Beyond its causes, climate change itself is also directly exacerbating pandemic risks by causing further animal migrations and allowing other pathogen-carriers like mosquitoes to expand their range of travel across the globe,[45] as well as by thawing the Arctic permafrost and potentially releasing diseases that have been dormant for tens of thousands of years.[46] In other words, pandemic risks *are* environmental risks.

[39] Chenet, H., Ryan-Collins, J. and van Lerven, F. (2019). Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach. UCL Institute for Innovation and Public Purpose, Working PaperSeries (IIPP WP 2019-13).
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2019-13-climate-related-financial-policy-in-a-world-of-radical-undertainty-web.pdf

[40] Kedward, K., Ryan-Collins, J. and Chenet, H. (2020). Managing nature-related financial risks: a precautionary policy approach for central banks and financial supervisors. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2020-09).
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/final_iipp-wp2020-09-kedward_et_al_nature-related_finance_edited_15_sept.pdf

[41] As highlighted by the UN's 2020 production gap report: "To follow a 1.5°C-consistent pathway, the world will need to decrease fossil fuel production by roughly 6% per year between 2020 and 2030". This required rapid decrease means that we can no longer afford new fossil fuel projects, nevermind existing ones. Thus excluding assets linked to new fossil fuel projects and penalising / limiting financing for such projects should be a top priority for central banks and supervisors.

[42] Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach.
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2019-13-climate-related-financial-policy-in-a-world-of-radical-undertainty-web.pdf

[43] Laurie Macfarlane (7 January 2021). Why 2021 is humanity's make-or-break moment on climate breakdown.
https://www.opendemocracy.net/en/oureconomy/why-2021-is-humanitys-make-or-break-moment-on-climate-breakdown/ ; John Vidal (18 March 2020). "'Tip of the iceberg': is our destruction of nature responsible for Covid-19?" The Guardian.
https://www.theguardian.com/environment/2020/mar/18/tip-of-the-iceberg-is-our-destruction-of-nature-responsible-for-covid-19-aoe

[44] Jonathan Watts (7 May 2020). "'Promiscuous treatment of nature' will lead to more pandemics – scientists."
https://www.theguardian.com/environment/2020/may/07/promiscuous-treatment-of-nature-will-lead-to-more-pandemics-scientists

[45] Jeff Goodell (7 December 2020). How Climate Change Is Ushering in a New Pandemic Era. Rolling Stone.
https://www.rollingstone.com/culture/culture-features/climate-change-risks-infectious-diseases-covid-19-ebola-dengue-1098923/ ; Sadie J. Ryan et al (28 March 2019). Global expansion and redistribution of Aedes-borne virus transmission risk with climate change. PLOS Neglected Tropical Diseases.
https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0007213

[46] Zach Boren (3 July 2020). The permafrost pandemic: could the melting Arctic release a deadly disease. Unearthed.
https://unearthed.greenpeace.org/2020/07/03/arctic-permafrost-pandemic-life-uh-finds-a-way/

Central banks have largely failed to recognise these interconnections.[47] Less than one percent of central banks and supervisors have incorporated sustainability factors into their COVID-19 crisis response measures.[48] In some cases, they have even claimed that the pandemic has required them to divert attention from the climate agenda: in the UK, when the Bank of England (BoE) came under fire for the carbon bias in its corporate bond and commercial paper purchases, Governor Andrew Bailey cited the COVID-19 crisis as a justification for temporarily deprioritising the Bank's goal of combating the adverse effects of climate change.[49]

Delaying climate and ecological action in the economic response to and recovery from COVID-19 is dangerous and counterproductive. The consequences of these actions will include greater risk of pandemics down the line, on top of rising sea levels, droughts, food crises and other devastating environmental impacts. Indeed, Dikau et al. (2020)[50] argue that "[t]he shock caused by COVID-19 has served to deepen rather than deflect the strategic case for central banks and supervisors to fully integrate the long-term risks associated with climate change and environmental degradation into their routine operations" and the pandemic "has been a live 'transition stress test', showing that sustainability factors are not a distant threat but are shaping markets today." They also highlight that "[l]iquidity-enhancing stimulus measures that are not aligned with sustainability objectives could contribute significantly to the build-up of sustainability-related risks in portfolios of financial institutions and within the financial system as a whole."[51]

As our global economic system's unabated assault on nature ushers in a "pandemic era" (Morens and Fauci 2020), [52] it is more urgent than ever that all central banks play their part in building a more just and sustainable economy.

[47] A notable exception is a Banque de France blog post (published 15 April 2020) highlighting the links between health risks and environmental risks, arguing that dealing with "COVID first and the climate afterwards" is an inadequate approach. Available here:
https://covid19-economie.banque-france.fr/comprendre/le-covid-19-dabord-et-le-climat-apres-pas-si-simple-liens-entre-risques-sanitaires-et-environnementaux/

[48] Dikau S, Robins N and Volz U (2020). A Toolbox of Sustainable Crisis Response Measures for Central Banks and Supervisors, Second Edition: Lessons from Practice. INSPIRE Briefing Paper.

https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/11/INSPIRE-toolbox_-2nd-Edition-1.pdf

[49] Bank of England (1 July 2020). Statement on Bank's commitment to combatting climate change.
https://www.bankofengland.co.uk/news/2020/july/statement-on-banks-commitment-to-combatting-climate-change

[50] A Toolbox of Sustainable Crisis Response Measures for Central Banks and Supervisors, Second Edition: Lessons from Practice. Page 4.
https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/11/INSPIRE-toolbox_-2nd-Edition-1.pdf

[51] Ibid, page 5.

[52] Morens, David M, and Anthony S Fauci. "Emerging Pandemic Diseases: How We Got to COVID-19." Cell vol. 182,5 (2020): 1077-1092.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7428724/

Section 2: What does a green central bank look like?

Central banks are complex and multifaceted institutions. In different countries, they have different powers, responsibilities and policymaking traditions. So what exactly does it mean for a central bank to 'go green'?

This section outlines the types of policies an ideal green central bank and (where relevant) financial regulator would adopt across four categories: *Research and Advocacy*, *Monetary Policy*, *Financial Policy,* and *Leading by Example*.[53] Some of the policies discussed do not fit neatly into a single one of these categories, as they could be considered both monetary and prudential tools.[54] Our classification of policies draws considerably from Dikau et al. (2020)[55] and D'Orazio and Popoyan (2019).[56]

2.1 Research and advocacy

In their journey towards greening their operations, it is important for central banks to deepen their understanding of environmental risks and sustainable finance via research activities, as well as promote an understanding of these issues across the financial sector, the wider economy, and the public at large. This can be achieved by participating in forums such as the NGFS and the Sustainable Banking Network (SBN), and the preparation and publication of research reports, monetary and financial policy reviews, working papers, and speeches.

Membership in the NGFS

The NGFS is the key forum for research collaboration and sharing of best practices among central banks and supervisors working on environment-related issues. In order to join, institutions are required to submit an official request—signed by their Governor or Head of Supervision—to the Chair of the NGFS, outlining their motivation for joining and relevant activities they have already undertaken. Once approved, members are required to abide by a set of commitments, including participation in a workstream and active contribution to the preparation of research reports and other initiatives that support central banks' and supervisors' green ambitions.[57] Given the application process and commitments required by the NGFS, membership clearly demonstrates to financial institutions that their regulators recognise the importance of, and are actively contributing to work on, environmental risks.

Taking a leadership role in the network by chairing one of its five workstreams or joining the steering committee shows further commitment to the cause.[58] Membership in other forums such as the Sustainable Banking Network (SBN) could provide similar benefits and further demonstrate motivation to play a role in greening the financial system.[59]

[53] Not all central banks typically use the tools discussed here, and some of these policies may require authorisation from treasuries and finance departments.

[54] For example, reserve requirements and direct credit allocation tools can serve both monetary and prudential purposes. See: Simon Gray (February 2011). Central Bank Balances and Reserve Requirements. IMF Working Paper. https://www.imf.org/external/pubs/ft/wp/2011/wp1136.pdf

[55] Dikau S, Robins N and Volz U (2020). A Toolbox of Sustainable Crisis Response Measures for Central Banks and Supervisors, Second Edition: Lessons from Practice. INSPIRE Briefing Paper. https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/11/INSPIRE-toolbox_-2nd-Edition-1.pdf

[56] Paola D'Orazio, Lilit Popoyan. "Fostering green investments and tackling climate-related financial risks: Which role for macroprudential policies?" Ecological Economics, Volume 160, 2019. Pages 25-37. ISSN 0921-8009. https://www.sciencedirect.com/science/article/abs/pii/S0921800918309601

[57] NGFS (2020). Charter of the Central Banks and Supervisors Network for Greening the Financial System.

https://www.ngfs.net/sites/default/files/media/2020/09/03/ngfs_charter_final.pdf

[58] NGFS (2020). Charter of the Central Banks and Supervisors Network for Greening the Financial System.

https://www.ngfs.net/sites/default/files/media/2020/09/03/ngfs_charter_final.pdf

[59] Sustainable Banking Network Task Force (June 2020). Necessary Ambition: How Low-Income Countries Are Adopting Sustainable Finance to Address Poverty, Climate Change, and Other Urgent Challenges.
https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/company-resources/sustainable-finance/sbn

Environmental publications

In addition to research and advocacy activities undertaken as part of forums like the NGFS, central banks can expand their knowledge and amplify their impact by publishing their own speeches, research reports, and articles that explore environmental risks and recognise their relevance to central banks' operations. The Banque de France (BdF) stands out in this regard, as it has hosted multiple conferences and published a wide range of groundbreaking publications on environmental risks and green finance.[60] Furthermore, a 2019 report by the Official Monetary and Financial Institutions Forum (OMFIF) identified the ECB, the BoE, and the Bank of Greece as the most vocal central banks on climate change.[61]

2.2 Monetary policy

Monetary policy is the primary responsibility of central banks, aiming to keep inflation low and stable by influencing the money supply and costs of borrowing. It is also frequently used to stabilise financial markets and support government's goals, such as economic growth and employment. Traditionally, the base interest rate has been the primary tool of monetary policy, but since the global financial crisis, policymakers have expanded their toolbox with new schemes such as asset purchase programmes and funding and refinancing facilities. Greening monetary policy operations and further expanding the monetary toolkit to support environmental targets is central to the green central banking agenda.

Asset purchases and monetary reserves[62]

Central banks have made extensive use of asset purchase programmes in their fight against the economic fallout of COVID-19.[63] At the beginning of the pandemic, the Federal Reserve launched an unlimited Quantitative Easing (QE) programme, as well as a range of new facilities aimed at purchasing commercial paper, municipal debt, and bond ETFs.[64] Unfortunately, schemes that involve the purchase of corporate assets are often highly carbon-intensive.[65]

Following pressure and criticism from civil society,[66] there is growing recognition within central banks that these schemes must be decarbonised. In March 2021, following a change to its monetary policy remit,[67] the BoE confirmed that it would adjust its Corporate Bond Purchase Scheme "to account for the climate impact of the issuers of the bonds we hold."[68]

[60] For example, the BdF's June 2019 Financial Stability Review was entitled "Greening the Financial System: the new frontier" and included 9 chapters on climate-related risk and green finance: https://publications.banque-france.fr/sites/default/files/media/2019/08/27/financial_stability_review_23.pdf Furthermore, it collaborated with the BIS on an ambitious and highly influential book entitled "The Green Swan: central banking and financial stability in the age of climate change": https://www.bis.org/publ/othp31.pdf. The BdF has also published multiple working papers on cutting edge climate-related research, most recently, for example, on aligning collateral policy with climate targets: Antoine Oustry et al (December 2020). Climate-related Risks and Central Banks' Collateral Policy: a Methodological Experiment. Banque de France.
https://www.banque-france.fr/sites/default/files/wp790.pdf

[61] OMFIF (2019). Special report: Central banks and climate change.https://www.omfif.org/wp-content/uploads/2020/02/ESG.pdf

[62] It should be noted that while we have classified monetary reserves under monetary policy, they are not always and everywhere held for monetary policy purposes; they are also often held by central banks on behalf of national governments.

[63] For a full list of central banks' actions, see OMFIF's central bank policy tracker: https://www.omfif.org/policy-tracker/

[64] Board of Governors of the Federal Reserve System (23 March 2020). "Federal Reserve announces extensive new measures to support the economy." Press Release.

https://www.federalreserve.gov/newsevents/pressreleases/monetary20200323b.htm

[65] David Barmes, Danisha Kazi and Simon Youel (July 2020). The Covid Corporate Financing Facility. Positive Money.

http://positivemoney.org/wp-content/uploads/2020/07/CCFF-Final-version.pdf; Yannis Dafermos et al (October 2020). Decarbonising Is Easy: Beyond Market Neutrality In The ECB's Corporate QE. New Economics Foundation. https://neweconomics.org/uploads/files/Decarbonising-is-easy.pdf; Yannis Dafermos et al (August 2020). Decarbonising The Bank Of England's Pandemic QE 'Perfectly Sensible'. New Economics Foundation. https://neweconomics.org/uploads/files/NEF-Decarbonise-BoE-report.pdf

[66] Positive Money (2021). "Bank of England: Stop funding the climate crisis and regulate the banks that do." Partnership petition with SumOfUs and 350.org.

https://actionnetwork.org/petitions/bank-of-england-stop-funding-the-climate-crisis-and-regulate-the-banks-that-do; SumOfUs (2020). "European Central Bank: Stop funding the climate crisis!" Partnership petition with Reclaim Finance and 350.org. https://actions.sumofus.org/a/european-central-bank-stop-funding-the-climate-crisis; Decarbonising Is Easy: Beyond Market Neutrality In The ECB's Corporate QE. https://neweconomics.org/uploads/files/Decarbonising-is-easy.pdf; Paul Schreiber and Lucie Pinson (September 2020). "Quantitative Easing and Climate 2: Fueling The Fossil Gas Frenzy - Memo." Reclaim Finance.

https://reclaimfinance.org/site/wp-content/uploads/2020/09/RF-QE-and-climate-2-The-ECB-is-fueling-the-gas-frenzy.pdf

[67] HM Treasury (3 March 2021). Monetary Policy Remit: Budget 2021.
https://www.gov.uk/government/publications/monetary-policy-remit-budget-2021/monetary-policy-remit-budget-2021

[68] Bank of England (3 March 2021). MPC Remit statement and letter and FPC Remit letter.
https://www.bankofengland.co.uk/news/2021/march/mpc-remit-statement-and-letter-and-fpc-remit-letter

President of the ECB Christine Lagarde, President of the DNB Klaas Knot, and Governor of the BdF Villeroy de Galhau have also recently expressed an interest in moving away from targeting market neutrality to decarbonise corporate bond asset purchases.[69] Putting this into action, the Sveriges Riksbank[70] announced that it would "only offer to buy corporate bonds issued by companies deemed to comply with international standards and norms for sustainability".[71]

The Sveriges Riksbank's corporate bond policy followed a similar announcement the year before concerning its monetary reserves.[72] The Bank announced that it was decarbonising its monetary reserves by selling off bonds issued by regions with high carbon emissions, including the Canadian province of Alberta and the Australian states of Queensland and Western Australia.[73] More recently, the Swiss central bank announced a decision to exclude "all companies primarily active in the mining of coal from our portfolios", which is particularly significant given the sheer size of Switzerland's foreign currency reserves.[74] Even where reserves are smaller, taking steps to decarbonise them should be seen as an important part of decarbonising central banks' balance sheets.[75]

Collateral frameworks

Collateral frameworks determine the eligible assets that central banks accept as collateral when they lend to commercial banks. Eligible assets deemed to be riskier than others are then subjected to 'haircuts',[76] decreasing their value as collateral. Central banks often use internal assessments and external rating agencies to determine where haircuts are assigned or adjusted. Collateral policy affects banks' balance sheets and the value of assets across the financial system, as banks generally have an interest in holding assets that are treated favourably in collateral frameworks.[77]

Currently, the majority of central banks' collateral frameworks do not account for environmental risks, primarily because rating agencies have not yet adequately incorporated these risks into their assessments.[78] That said, central banks are increasingly recognising that this needs to change: the People's Bank of China (PBoC) already accepts green bonds as collateral in its medium term lending facility,[79] and the ECB recently announced that it would accept sustainability-linked bonds as collateral for Eurosystem credit operations and consider accepting them in their Asset Purchase Programme and Pandemic Emergency Purchase Programme.[80] Additionally, the BdF has published a working paper outlining an approach to align collateral frameworks with climate targets, requiring banks to pledge pools of collateral that are aligned with Paris Agreement targets.[81]
Experts have also proposed the outright exclusion of the most carbon-intensive and ecologically harmful assets from collateral frameworks, or haircuts to decrease their value, incentivising banks to shift away from these assets.[82] McConnell et al. (2020), for example, argue that "adding collateral 'haircuts' based on assets' carbon intensity to the central bank collateralised lending framework" is "the most promising conduit of green monetary policy".[83]

Funding and refinancing schemes

Funding and refinancing schemes serve to provision the banking system with liquidity. Conventional refinancing operations are not conditional on the destination of lending, but some central banks have started using facilities that specifically incentivise lending to SMEs and the real economy more broadly. For example, the ECB's Targeted Long-Term Refinancing Operations (TLTROs) offer low interest rates for lending to the real economy.[84] Since the beginning of the pandemic, multiple central banks—including the BoE, the Federal Reserve, the Reserve Bank of Australia, and the Saudi Arabian Monetary Authority (SAMA)—have introduced targeted funding for lending schemes.[85]

In addition to incentivising real economy lending, targeted funding and refinancing schemes should also offer cheap funding for sustainable investments. Over 125 experts have backed this proposal in the UK,[86] and in the EU, van Tillburg and van't Klooster's proposal for "Green TLTROs"[87] has been welcomed by senior central bankers in Europe.[88] Such a policy would boost the green recovery, and thereby protect long-run financial stability by mitigating climate and nature-related financial risks. For these facilities to be truly 'green', it is also essential that they exclude fossil fuel lending, and align eligible collateral with environmental targets.

The same principle could also be applied more broadly to conventional non-targeted liquidity operations, whereby the interest rates applied to banks would vary depending on an assessment of how green their lending is.[89] This also has the potential to materially incentivise a shift to greener lending practices, as banks' refinancing costs would increase if they continued to issue environmentally harmful loans (and conversely decrease, if they align their lending with environmental targets).

Reserve requirements and interest rates

Reserves consist of the physical cash held by a bank, and its electronic deposits held at the central bank. Both kinds of reserves are created by central banks and are not lent out to the public; they are lent and transferred between banks and serve to meet cash withdrawals.[90] In some countries, central banks impose reserve requirements, which require banks to hold an amount of reserves equal to a certain percentage of the stock of its customers' deposits, for both

[69] Klaas Knot (11 February 2021). "Getting the Green Deal done: how to mobilize sustainable finance." Der Nederlandsche Bank. https://www.dnb.nl/publicaties/publicaties-dnb/speeches/speech-klaas-knot-getting-the-green-deal-done-how-to-mobilize-sustainable-finance/; François Villeroy de Galhau (11 February 2021). Speech: The role of central banks in the greening of the economy. https://www.banque-france.fr/en/intervention/role-central-banks-greening-economy; Christine Lagarde (October 2020). Keynote Speech at the United Nations Environment Programme Finance Initiative Global Roundtable on Sustainable Finance. Available at: https://youtu.be/xtMYoRvxesg

[70] The central bank of Sweden.

[71] Sveriges Riksbank (25 November 2020). "Annex to the minutes B: Programme for the Riksbank's asset purchases for monetary policy purposes in 2021." https://www.riksbank.se/globalassets/media/rapporter/ppr/engelska/2020/201126/annex-to-the-minutes-b-programme-for-the-riksbanks-asset-purchases-for-monetary-policy-purposes-in-2021.pdf

[72] It is common practice for central banks to hold sizeable reserves of foreign currencies both for monetary policy purposes as well as on behalf of their respective governments.

[73] Kelsey Johnson (13 November 2019). "Sweden's central bank sells off bonds from Canadian province over climate concerns." Reuters. https://www.reuters.com/article/us-canada-bonds-sweden-idUSKBN1XN2O9

[74] Thomas Jordan (17 December 2020). Introductory remarks at Swiss National Bank news conference.

https://www.snb.ch/en/mmr/speeches/id/ref_20201217_tjn/source/ref_20201217_tjn.en.pdf

[75] OMFIF's global public investor reports track the evolution of central banks' holdings of foreign exchange reserves and how they are managed: https://www.omfif.org/gpi2020/

[76] The term 'haircut' refers to a reduction applied to the value of a financial asset.

[77] Kjell G. Nyborg (11 July 2017). "Collateral policy—central banking's powerful secret ingredient." International Banker. https://internationalbanker.com/banking/collateral-policy-central-bankings-powerful-secret-ingredient/

[78] Pierre Monnin (September 2018). Central banks should reflect climate risks in monetary policy operations. SUERF Policy Note. Issue No 41. https://www.suerf.org/docx/f_936824c0191953647ec609b4f49bc964_3325_suerf.pdf

[79] June Choi, Donovan Escalante and Mathias Lund Larsen (August 2020). Discussion Brief: "Green Banking in China – Emerging Trends: With a spotlight on the Industrial and Commercial Bank of China". Climate Policy Initiative. https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf

[80] European Central Bank (22 September 2020). "ECB to accept sustainability-linked bonds as collateral." Press Release. https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200922~482e4a5a90.en.html

[81] Antoine Oustry et al (December 2020). Climate-related Risks and Central Banks' Collateral Policy: a Methodological Experiment. Banque de France. https://www.banque-france.fr/sites/default/files/wp790.pdf

[82] Frank van Lerven (2020). Banking on coal: how central banks can address the financial risks and support a capital shift away from coal. New Economics Foundation. https://neweconomics.org/uploads/files/BankingOnCoal_200204_180818.pdf

[83] McConnell, Andrew and Yanovski, Boyan and Lessmann, Kai, Central Bank Collateral as an Instrument for Climate Mitigation (May 22, 2020). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3630662

[84] ECB (2021). "Targeted longer-term refinancing operations (TLTROs)." https://www.ecb.europa.eu/mopo/implement/omo/tltro/html/index.en.html

[85] Kaleb Nygaard (23 March 2020). "Central Banks Launch Funding for Lending Programs." Yale School of Management. https://som.yale.edu/blog/central-banks-launch-funding-for-lending-programs

[86] New Economics Foundation (19 November 2020). "Bank of England needs more powers to decarbonise economy, say experts." https://neweconomics.org/2020/11/bank-of-england-needs-more-powers-to-decarbonise-economy-say-experts

[87] Green TLTROs are "refinancing operations where the interest rate that banks pay is determined by the volume of Taxonomy-compliant loans issued by the bank." See: Jens van 't Klooster and Rens van Tilburg (September 2020). "Targeting a sustainable recovery with Green TLTROs." Positive Money Europe and Sustainable Finance Lab. http://www.positivemoney.eu/wp-content/uploads/2020/09/Green-TLTROs.pdf

[88] See, for example: Isabel Schnabel (28 September 2020). Speech: "When markets fail – the need for collective action in tackling climate change." https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200928_1~268b0b672f.en.html

[89] Jézabel Couppey-Soubeyran (December 2020). "The Role of Monetary Policy in the Ecological Transition: An Overview of Various Greening Options." Veblen Institute for Economic Reforms.

https://www.veblen-institute.org/IMG/pdf/the_role_of_monetary_policy_in_the_ecological_transition_an_overview_of_various_greening_options.pdf

[90] Michael McLeay, Amar Radia and Ryland Thomas (2014). "Money creation in the modern economy." Quarterly Bulletin 2014 Q1. Bank of England. https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy.pdf

[91] For more information on the use of reserve requirements for prudential purposes, see:

Cordella, Tito, Pablo Federico, Carlos Vegh and Guillermo Vuletin (2014). Reserve Requirements in the Brave New Macroprudential World. World Bank Studies. Washington, DC: World Bank. http://documents1.worldbank.org/curated/ru/566221468276340453/pdf/Reserve-requirements-in-the-brave-new-macroprudential-world.pdf

monetary and prudential purposes.[91]
Many central banks in high income economies, such as the Bank of England and the Bank of Canada, no longer have any reserve requirements, and supply reserves to the banking system on demand.[92] However, where reserve requirements are still in use, as is the case in many emerging market economies, central banks could differentiate requirements depending on how green a bank's lending is. This would incentivise green loans, as a relatively lower reserve requirement would allow a bank to increase its lending and therefore its profitability.[93] The Banque du Liban[94] implemented such a mechanism in 2010, reducing reserve requirements by 100% to 150% of the value of loans to environmentally friendly projects.[95]

Another policy option available to central banks is the differentiation of the interest rate on required reserves, rather than differentiation of their required quantity. This approach has been adopted by the PBoC, which pays banks a slightly higher interest rate on required reserves if they obtain a positive green assessment in the central bank's macroprudential assessment process.[96] Ma Jun (China's most preeminent green finance expert, and representative of the PBoC at the NGFS) has recently suggested that the PBoC should improve this mechanism among others to further incentivise green lending.[97]

Direct credit allocation

While many of the proposals outlined so far would have allocative effects, more direct instruments, such as credit limits and quotas, can be utilised to guide credit from unsustainable to sustainable sectors of the economy. In the post-WW2 period, direct credit allocation policies were commonplace,[98] supporting industrial and development strategies across both advanced and emerging market economies, and they remain relatively widely used today in the latter. Direct credit allocation often serves prudential and/or industrial rather than monetary goals, but—following Dikau et al. (2020)[99]—we classify it here under monetary policy, due to the use of typically monetary tools.

There is a strong case for the introduction and, where they already exist,[100] expansion of direct credit allocation policies that specifically steer credit towards assets that support a fair and green recovery.[101] This could include, for example, requiring that banks set differing interest rate caps and floors on loans to green and dirty activities. The implementation of even more ambitious tools, such as directly limiting or banning investment in certain sectors and fostering it in others, could surpass some of the proposals above: for example, if central banks and regulators were to place a complete ban on the financing of new fossil fuel activities, a higher risk weight attached to new fossil fuel exposures would no longer be necessary.

Any potential concerns about the intrusionary nature of such restrictions on banks should be weighed against the urgency of the climate and ecological crises and the unprecedented risks they pose. In fact, the latest NGFS guidance opens the door to such measures, stating that "if supervisors find that the level of risk driven by climate-related and environmental factors is excessively high, they could require institutions to reduce such risks by applying measures such as [...] limiting or prohibiting them from carrying out certain categories of activities".[102]

[91] Michael McLeay, Amar Radia and Ryland Thomas (2014). "Money creation in the modern economy." Quarterly Bulletin 2014 Q1. Bank of England.
https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy.pdf

[93] Simon Dikau and Josh Ryan-Collins (27 October 2017). Green Central Banking In Emerging Market And Developing Country Economies. New Economics Foundation.
https://neweconomics.org/uploads/files/Green-Central-Banking.pdf

[94] The central bank of Lebanon.

[95] Emanuele Campiglio (June 2014). "Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy." Centre for Climate Change Economics and Policy. Working Paper No. 181. Grantham Research Institute on Climate Change and the Environment Working Paper No. 160.
https://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/06/Working-Paper-160-Campiglio-20142.pdf

[96] June Choi, Donovan Escalante and Mathias Lund Larsen (August 2020). Discussion Brief: "Green Banking in China – Emerging Trends: With a spotlight on the Industrial and Commercial Bank of China". Climate Policy Initiative.

https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf

[97] Ma Jun (2021). "Improve the green financial system with the goal of carbon neutrality." Financial Times. https://mp.weixin.qq.com/s/6ToLdxGdsKSY3d7eMVODUg

[98] Bezemer, D., Ryan-Collins, J., van Lerven, F. and Zhang, L. (2018). Credit where it's due: A historical, theoretical and empirical review of credit guidance policies in the 20th century. UCL Institute for Innovation and Public Purpose Working Paper Series (IIPP WP 2018-11).
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2018-11_credit_where_its_due.pdf

[99] Dikau S, Robins N and Volz U (2020). A Toolbox of Sustainable Crisis Response Measures for Central Banks and Supervisors, Second Edition: Lessons from Practice. INSPIRE Briefing Paper.

https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/11/INSPIRE-toolbox_-2nd-Edition-1.pdf

[100] Green credit guidance policies were already partly in place in China and other emerging markets prior to the COVID-19 crisis. See: Simon Dikau and Josh Ryan-Collins (27 October 2017). Green Central Banking In Emerging Market And Developing Country Economies. New Economics Foundation.
https://neweconomics.org/uploads/files/Green-Central-Banking.pdf

[101] Josh Ryan-Collins (26 May 2020). "Central banks must change course if they are to lead us out of the coronavirus crisis." The Guardian.

https://www.theguardian.com/commentisfree/2020/may/26/banks-uk-recover-coronavirus

[102] NGFS (May 2020). "Guide for Supervisors - Integrating climate-related and environmental risks into prudential supervision." Technical document.

https://www.ngfs.net/sites/default/files/medias/documents/ngfs_guide_for_supervisors.pdf

Coordination with fiscal authorities

Many of the policies outlined above will require greater interaction and coordination with fiscal authorities to ensure central bank accountability and democratic legitimacy, as outlined by Macquarie et al. (2019).[103] Taking this coordination a step further, central banks should also directly support the green spending of fiscal authorities. For example, central banks could directly finance green spending, purchase green sovereign bonds, and/or fund sustainable lending by public banks and development finance institutions.[104] Along similar lines, a recent OMFIF report explores how central banks can, and in some cases already do, cooperate with sovereign funds.[105] The demands of the COVID-19 crisis have already prompted monetary authorities to—directly or indirectly—support the emergency spending programmes of finance ministries.[106] Central banks should draw lessons from this coordination, and explore how it can best be applied to supporting the transition to a sustainable economy.

Another form of monetary-fiscal coordination that has emerged in response to the pandemic is the joint implementation of corporate financing facilities. For example, in the UK, the Treasury and the Bank of England jointly announced a Covid Corporate Financing Facility (CCFF), a multi-billion pound scheme that purchased commercial paper—a form of short-term debt—from large corporations affected by the economic downturn.[107] Following a successful campaign to improve the transparency of the scheme,[108] a Positive Money report found that the CCFF—similar to the BoE's corporate bond purchase scheme—was highly carbon-intensive, with 56% of funds going to high-carbon sectors (Barmes et al. 2020).[109] Coordination to support companies in financial distress is perfectly sensible, but it must not unconditionally prop up those that are driving climate and ecological breakdown. At the very least, such support must be tied to social and environmental conditions. For example, the Canadian government made TCFD disclosures an eligibility condition for participation in a similar scheme to the UK's CCFF.[110]

Coordination with fiscal authorities need not undermine central banks' operational independence. As outlined in section 2, tackling climate and ecological breakdown is necessary to protect price and financial stability, and support for government objectives is often written into the secondary mandates of central banks. Exploring the best ways to fulfill these responsibilities in coordination with fiscal authorities would demonstrate the value of operational independence, rather than threaten it.

[103] Rob Macquarie, Fran Boait, David Clarke (2019). Seeking Legitimacy: A new settlement for the Bank of England.

http://positivemoney.org/wp-content/uploads/2019/10/Positive-Money-Seeking-Legitimacy.pdf

[104] In the UK, experts have called for the Bank of England to re-invest its CCFF proceeds into the capitalisation of a new Green Investment Bank: New Economics Foundation (19 November 2020). "Bank of England needs more powers to decarbonise economy, say experts."
https://neweconomics.org/2020/11/bank-of-england-needs-more-powers-to-decarbonise-economy-say-experts

[105] OMFIF (2020). Central bank – sovereign fund co-operation. Global Public Investor 2020, chapter 4.

https://www.omfif.org/wp-content/uploads/2020/10/4-Central-bank-sovereign-fund-co-operation.pdf

[106] Adair Turner (20 April 2020). "Monetary Finance Is Here." Project Syndicate.

https://www.project-syndicate.org/commentary/monetary-finance-of-covid19-fiscal-deficits-by-adair-turner-2020-04?barrier=accesspaylog ; Olivier Blanchard, Jean Pisani-Ferry (10 April 2020). "Monetisation: Do not panic." Vox EU. https://voxeu.org/article/monetisation-do-not-panic

[107] Bank of England (17 March 2020). "HM Treasury and the Bank of England launch a Covid Corporate Financing Facility (CCFF)." News Release.
https://www.bankofengland.co.uk/news/2020/march/hmt-and-boe-launch-a-covid-corporate-financing-facility

[108] Simon Youel (19 May 2020). "Bank of England comes clean on corporate bailouts following Positive Money campaign." Positive Money.
https://positivemoney.org/2020/05/press-release-govt-and-boe-comes-clean-on-corporate-bailouts/

[109] David Barmes, Danisha Kazi and Simon Youel (July 2020). The Covid Corporate Financing Facility. Positive Money.
http://positivemoney.org/wp-content/uploads/2020/07/CCFF-Final-version.pdf

[110] Justin Trudeau, Prime Minister of Canada (May 11, 2020). "Prime Minister announces additional support for businesses to help save Canadian jobs."

https://pm.gc.ca/en/news/news-releases/2020/05/11/prime-minister-announces-additional-support-businesses-help-save

2.3 Financial policy

The main component of financial policy—often referred to as 'prudential' policy—is the management and mitigation of financial risk at the level of individual financial institutions (microprudential) and the financial system as a whole (macroprudential).[111] In some countries financial policy is the responsibility of the central bank; in others it is that of a separate supervisory authority, and in certain cases responsibility is shared across institutions. We use the term 'financial' policy here, rather than 'prudential' policy, to encompass measures that go beyond a pure 'risk management' focus and towards the direct regulation of financial institutions' impacts.

Disclosures and stress-tests

Climate and nature-related disclosures and stress tests, although alone a severely insufficient strategy for greening the financial system, should be extended and enhanced to allow for a better exploration of climate and nature-related financial risks. The radical uncertainty inherent in climate and ecological breakdown will prevent precise quantification of these risks,[112] but improved disclosures and stress tests can provide a better understanding of their nature, location and approximate scale, as well as the extent to which financial institutions are contributing to their build-up.[113] Evidence from the BdF[114] also suggests that climate-related disclosure requirements for financial institutions can materially reduce fossil fuel financing: investors subjected to mandatory climate-related disclosure requirements in France from January 2016 cut their financing of fossil fuel companies by 40% compared to investors that were not required to disclose.[115]

In 2020, the governments of the UK[116] and New Zealand[117] were among the first to outline plans for making climate disclosures mandatory economy-wide, in line with the recommendations made by the Task Force for Climate-related Financial Disclosures.[118] Alongside (or integrated into) TCFD disclosures, regulators should mandate full portfolio carbon accounting for financial institutions. This will allow regulators to gain a deeper understanding of both the climate risks and impacts of financial institutions.[119] Given the severity of nature-related financial risks, and the fact that in 2019 alone the world's largest banks invested USD 2.6 trillion into the primary drivers of biodiversity destruction,[120] disclosures should also be further extended to include nature-related risks and impacts. Initiatives such as the Task Force on Nature-related Financial Disclosure (TFND)[121] and the Partnership for Biodiversity Accounting Financials (PBAF)[122] are set to drive progress in this space.

Meanwhile, NGFS scenarios—which currently lack ambition, and rely too heavily on negative emissions technologies—must include a 1.5 degree Celsius pathway with no carbon dioxide removal as a central scenario for stress testing exercises.[123] The methodologies underpinning stress testing frameworks and exercises could also be improved. Integrated Assessment Models (IAMs) are generally used to assess climate shocks' impact on the macroeconomy or particular sectors of the economy. As outlined by Bolton et al (2020), the limitations of IAMs call for central banks to incorporate alternative methodologies, including non-equilibrium models, sensitivity analyses, and case studies that delve into specific risks and transmission channels.[124]

Capital instruments

Despite the value of exploring risks using stress testing, and the potential of this approach to inform prudential policies, there is no need to wait for the results of such exercises to start adapting prudential regulation to the realities of climate and nature-related risks. Given that assets most associated with climate and ecological breakdown will increasingly feed financial instability due to physical risks, and also present significant transition risks as societies shift to more sustainable economies, capital instruments—which determine the amount of capital financial institutions must hold to absorb losses from financial shocks—must be adapted without delay to account for these growing and unprecedented risks.[125]

Finance Watch has clearly outlined how climate-related risks can be incorporated into the risk weighted asset assessments that determine the amount of capital that institutions are required to hold against climate-related exposures. Specifically, their report highlights how capital requirements regulations in the EU can be amended to increase the risk weights of existing fossil fuel exposures to 150% and to 1250% for the financing of new fossil fuel exploration, exploitation, and production. As central banks and regulators develop a better understanding of nature-related risks, assets linked to the most environmentally destructive activities should eventually be treated in the same manner.

Central banks and supervisors could also lower the risk weights of less risky green exposures. There are emerging signs that green loans are less risky in certain sectors. For example, Guin and Korhonen (2020) found that mortgages against energy-efficient properties in the UK are less frequently in payment arrears than mortgages against energy-inefficient properties, partly due to lower energy bills. The Hungarian central bank, assuming that green housing loans are indeed less risky due to savings on energy bills and higher value of the homes in the future, has implemented a modest 'green supporting factor' in the housing sector, which accounts for 40% of the country's carbon emissions. This is expected to stimulate bank lending for the purchase and construction of energy efficient houses as well as retrofits on existing homes.[132] However, not all green exposures have lower risk, and clearly defining "green exposures" is more challenging than identifying fossil fuel exposures. There is also a risk of banks abusing lower risk-weights and thereby harming financial stability.

[111] This report does not draw a distinction between micro and macroprudential, given that the line between the two is often blurred, and the responsibility for both usually falls under a single prudential authority.

[112] Chenet, H., Ryan-Collins, J. and van Lerven, F.(2019). Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2019-13). https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2019-13-climate-related-financial-policy-in-a-world-of-radical-undertainty-web.pdf; Kedward, K., Ryan-Collins, J. and Chenet, H. (2020). Managing nature-related financial risks: a precautionary policy approach for central banks and financial supervisors. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2020-09).
https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/final_iipp-wp2020-09-kedward_et_al_nature-related_finance_edited_15_sept.pdf

[113] Patrick Bolton et al. (January 2020). The green swan: Central banking and financial stability in the age of climate change. BIS.
https://www.bis.org/publ/othp31.pdf

[114] Jean-Stéphane Mésonnier and Benoit Nguyen (January 2021). "Showing off cleaner hands: mandatory climate-related disclosure by financial institutions and the financing of fossil energy." Working paper #800. https://www.banque-france.fr/sites/default/files/medias/documents/wp800.pdf

[115] Reclaim Finance challenged the conclusion of this working paper, arguing that "Disclosure is not a silver bullet to climate change": https://reclaimfinance.org/site/en/2021/01/16/disclosure-is-not-a-silver-bullet-to-climate-change/

[116] HM Treasury (9 November 2020). "Chancellor sets out ambition for future of UK financial services." https://www.gov.uk/government/news/chancellor-sets-out-ambition-for-future-of-uk-financial-services

[117] Hon James Shaw (15 September 2020). "New Zealand first in the world to require climate risk reporting." New Zealand Government.
https://www.beehive.govt.nz/release/new-zealand-first-world-require-climate-risk-reporting

[118] Task Force on Climate-related Financial Disclosures (15 June 2017) Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures. https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf

[119] Partnership for Carbon Accounting Financials (2021). "Enabling financial institutions to assess and disclose greenhouse gas emissions of loans and investments." https://carbonaccountingfinancials.com/

[120] Portfolio Earth (2021). Bankrolling Extinction: The Banking Sector's Role in the Global Biodiversity Crisis.
https://portfolio.earth/wp-content/uploads/2021/01/Bankrolling-Extinction-Report.pdf

[121] More information about the TFND available at: https://tnfd.info/

[122] More information about the PBAF available at: https://pbafglobal.com/

[123] Romain Ioualalen, Paul Schreiber (February 2021). "NGFS Scenarios: Guiding Finance Towards Climate Ambition Or Climate Failure?" Reclaim Finance and Oil Change International. https://reclaimfinance.org/site/wp-content/uploads/2021/02/NGFS-scenarios-final.pdf

[124] Patrick Bolton et al. (January 2020). The green swan: Central banking and financial stability in the age of climate change. BIS.
https://www.bis.org/publ/othp31.pdf

[125] Thierry Philipponnat (June 2020). "Breaking the climate-finance doom loop: How banking prudential regulation can tackle the link between climate change and financial instability." Finance Watch. https://www.finance-watch.org/wp-content/uploads/2020/06/Breaking-the-climate-finance-doom-loop_Finance-Watch-report.pdf

[126] Ibid.

[127] Article 128 of the Capital Requirements Regulation (CRR) requires that items associated with particularly high risk must be assigned a risk weight of 150%.

[128] Finance Watch opts for a 1250% risk weight as this would make all new fossil fuel exploration, exploitation, and production entirely equity-funded.

[129] Maria Berenguer, Michel Cardona and Julie Evain (March 2020). Integrating Climate-related Risks into Banks' Capital Requirements. Institute for Climate Economics. https://www.i4ce.org/wp-core/wp-content/uploads/2020/03/IntegratingClimate_EtudeVA.pdf

[130] Benjamin Guin and Perttu Korhonen (January 2020). "Does energy efficiency predict mortgage performance?" Staff Working Paper No. 852. https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2020/does-energy-efficiency-predict-mortgage-performance.pdf

[131] Leena Fatin (7 January 2020). "How the Hungarian Central Bank could help solve the energy efficiency puzzle: MNB goes for green on housing loans." Climate Bonds Initiative. https://www.climatebonds.net/2020/01/how-hungarian-central-bank-could-help-solve-energy-efficiency-puzzle-mnb-goes-green-housing

[132] A related industry-led initiative—the Energy Efficient Mortgage Label—was launched in February 2021: https://hypo.org/emf/press-release/the-energy-efficient-mortgage-label-launch-a-quality-label-to-foster-energy-efficiency-in-buildings/

At the macroprudential level, countercyclical capital buffers are an important part of the toolkit, used to dampen the expansionary phases of credit cycles and increase the resilience of the banking system during periods of economic and financial contractions.[133] Dikau et al. (2020) found that in response to COVID-19, most prudential authorities have eased countercyclical capital buffers—and other prudential measures—in an attempt to stimulate lending, without any sustainability considerations.[134] Unless these tools are calibrated to account for and mitigate climate and nature-related risks, they may result in a build-up of environmental risks across the financial system as the economy recovers from the impacts of COVID-19. This would sow the seeds for further financial instability down the line, and undermine efforts to promote a green recovery.

The countercyclical capital buffer could be calibrated to account for the carbon intensity of aggregate credit growth across the financial system during the recovery from COVID-19.[135] This would limit carbon intensive exposures during the expansionary phase of the credit cycle, incentivising a shift to lower carbon assets, and build up capital buffers that could then protect against losses from carbon-intensive defaults as the transition accelerates.

Other capital instruments that could be calibrated to account for climate risk include large exposure restrictions, which are intended to protect financial institutions from the sudden failure of counterparties or a group of interconnected counterparties. In the Basel capital standards,[136] a large exposure is defined as "the sum of all exposures of a bank to a single counterparty that are equal to or above 10% of its Tier 1 capital" (BIS 2018).[137] The limit for large exposures is set at 25%, with a more stringent limit of 15% for exposures between global systemically important institutions.

Large exposure limits could be adjusted to include limits on exposures to highly carbon-intensive and ecologically harmful counterparties that are particularly vulnerable to transition risk. This would protect financial institutions from the default of counterparties suddenly affected by the transition to a sustainable economy, and would incentivise a reallocation of credit towards activities that are better aligned with the transition. Schoenmaker and van Tilburg (2016) identify the adjustment of risk weights and large exposure restrictions as "the most promising prudential instruments for carbon-intensive assets".[138]

Liquidity instruments

The term 'liquidity' refers to the amount of cash and assets that can be rapidly converted to cash in order to meet short-term financial obligations. Liquidity requirements promote the resilience of financial institutions during periods of financial distress. The two primary liquidity instruments introduced by the Basel framework since the global financial crisis are the Liquidity Coverage Ratio[139] and the Net Stable Funding Ratio (NSFR).[140] In their current design, however, these instruments are biased against green investment, as the former makes high quality liquid assets more attractive, and the latter makes capital-intensive long-term financing (such as financing of renewable energy projects) less attractive.[141] This highlights the need for the Basel framework to include greater consideration for the impact of its policies on sustainable finance and environmental risk in the future.
In order to remove their bias against green projects, liquidity instruments should be adapted to include green incentive mechanisms. For example, a lower required stable funding factor for green exposures would address the issue of the NSFR making long-term green projects costlier to finance.[142] The Bank of England's upcoming work on 'productive finance' [143] may look into such ideas, given that it aims to unlock finance for more productive investment, including longer term and less liquid assets such as renewable energy infrastructure.[144]

Impact-focused policies

The financial policies explored above largely involve the adaptation of existing prudential instruments. However, as argued by the Committee on Climate Change (CCC) in the UK, the financial system "must go beyond managing climate risk and focus on net-zero as a key goal" (Robins 2020).[145] As a result, the CCC recommended that financial institutions should be required to publish net zero carbon targets and plans.[146] Vaccaro and Barmes propose additional new impact-focused measures that central banks could explore, such as a 'polluter pays' principle for the financial sector, and the incorporation of climate checks into 'Know Your Customer' processes.[147]

Central banks and supervisors should also require that banks incorporate sustainable finance and net-zero targets into their governance structures. In Indonesia, for example, the Financial Services Authority requires banks to incorporate sustainable finance into their vision, mission and governance,[148] and Deutschebank[149] announced in 2020 that it will tie executive remuneration to progress on sustainability goals.[150] While the latter is currently a voluntary measure, central banks and supervisors should consider making it mandatory for all financial institutions.

[133] BIS (18 December 2020). "Countercyclical capital buffer (CCyB)." https://www.bis.org/bcbs/ccyb/

[134] Dikau S, Robins N and Volz U (2020). A Toolbox of Sustainable Crisis Response Measures for Central Banks and Supervisors, Second Edition: Lessons from Practice. INSPIRE Briefing Paper.
https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/11/INSPIRE-toolbox_-2nd-Edition-1.pdf

[135] Paola D'Orazio, Lilit Popoyan and Pierre Monnin (13 February 2019). "Prudential Regulation Can Help in Tackling Climate Change." Council on Economic Policies. https://www.cepweb.org/prudential-regulation-can-help-in-tackling-climate-change/

[136] The Basel capital standards are part of the Basel framework, a set of international standards for prudential regulation set by the Basel Committee on Banking Supervision. All members of the committee have agreed to implement the Basel standards in their jurisdictions. The framework should be reformed to set international minimum standards on the management of environmental risks, but until this occurs, individual prudential authorities must take their own initiative.

[137] BIS (30 April 2018). "The treatment of large exposures in the Basel capital standards - Executive Summary." https://www.bis.org/fsi/fsisummaries/largeexpos.htm

[138] Schoenmaker, D., Van Tilburg, R. (2016). "What Role for Financial Supervisors in Addressing Environmental Risks?" Comp Econ Stud 58, 317–334. https://link.springer.com/article/10.1057/ces.2016.11

[139] As outlined by the BIS, the LCR "promotes the short-term resilience of a bank's liquidity risk profile. It does this by ensuring that a bank has an adequate stock of unencumbered high-quality liquid assets (HQLA) that can be converted into cash easily and immediately in private markets to meet its liquidity needs for a 30 calendar day liquidity stress scenario." Source: Basel Committee on Banking Supervision (BCBS) (07 January 2013). "Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools." BIS. https://www.bis.org/publ/bcbs238.htm

[140] The NSFR refers to the ratio of available stable funding to required stable funding, which should be equal to at least 100%, over a one year time horizon. Source: Basel Committee on Banking Supervision (October 2014). "Basel III: the net stable funding ratio." BIS. https://www.bis.org/bcbs/publ/d295.pdf

[141] Patrick A. Narbel (October 2013). "The likely impact of Basel III on a bank's appetite for renewable energy." Department of Business and Management Science, Norwegian School of Economics financing. https://core.ac.uk/download/pdf/52096366.pdf

[142] European Banking Federation (28 September 2017). "EBF Report: Towards a Green Finance framework." https://www.ebf.eu/ebf-media-centre/towards-a-green-finance-framework/

[143] Bank of England (2021). Overview: "Working Group to facilitate investment in productive finance." https://www.bankofengland.co.uk/financial-stability/working-group-on-productive-finance

[144] This ambition for the productive finance working group was highlighted by the Bank of England in our bilateral interactions.

[145] Nick Robins (December 2020). "The road to Net-Zero Finance (Sixth Carbon Budget Advisory Group)." Advisory Group on Finance for the UK's Climate Change Committee.
https://www.theccc.org.uk/publication/the-road-to-net-zero-finance-sixth-carbon-budget-advisory-group/

[146] Ibid.

[147] James Vaccaro, David Barmes (forthcoming). Financial Stability in a Planetary Emergency: The role of banking regulators in a burning world. UNEP FI. After publication, available at: https://www.unepfi.org/publications/launch-of-climate-thought-leadership-series/

[148] Financial Services Authority (OJK) (2017). Technical Guidelines for Banks on the Implementation of OJK Regulation. POJK Number 51/POJK.03/. https://www.ifc.org/wps/wcm/connect/13d863ef-b8cf-4584-8602-14a63f9b9ede/Technical+Guideline+on+the+Implementation+of+POJK+51+2017+on+SF_English.pdf?MOD=AJPERES&CVID=mGmKSQ-

[149] Germany's largest commercial bank.

[150] LaToya Harding (6 December 2020). "Deutsche Bank to link executive pay to sustainability goal." Yahoo! Finance. https://uk.finance.yahoo.com/news/deutsche-bank-executive-pay-sustainability-goal-141310798.html

2.4 Leading by example

In this report, we use the term *Leading by Example* to encompass further initiatives that central bankers should undertake to demonstrate that they are greening their own institutions beyond their monetary and financial policy responsibilities. If central bankers take environmental risk and sustainable finance seriously, they must show leadership in disclosing their own environmental risks, greening their non-policy portfolios, supporting green initiatives and standard-making processes, providing education and training initiatives, and embedding sustainability principles within their own institutions.

Disclosing central banks' environmental risks

Central banks have large and growing balance sheets. Just as they should request mandatory disclosure of the environmental risks and impacts of commercial bank balance sheets, they should do the same for their own.[151] In 2020, the BoE published a report on its climate-related financial risks, showing that the corporate bond purchase scheme was aligned with 3.5 degrees of global warming,[152] far beyond the 'well below 2 degrees' target of the Paris Agreement. Other institutions such as the Brazilian central bank are undertaking similar exercises.[153] Disclosing these risks can help central banks understand where and how they should green monetary policy tools, as outlined above. In order to ensure proper transparency and accountability, central banks should consistently report these disclosures, and what they are doing to act on them, to elected officials.

Greening non-policy portfolios

Central Banks are significant asset owners managing multiple different types of portfolios in addition to their monetary policy portfolios.[154] These include portfolios aimed at generating a financial return, pension portfolios aimed at providing for the retirement pension obligations of central banks' employees, and third-party portfolios managed on behalf of external parties.[155] As the NGFS outlined in a 2019 technical document, central banks should—and are already starting to—apply sustainable and responsible investment (SRI) principles to these portfolios.[156] Their survey of 27 central banks found that 25 manage one or more portfolios for which SRI is already included or under consideration. For example, the BdF excludes investments in companies that derive more than 2% of their revenues from coal [157] and 10% from activities in shale oil and gas, tar sands and/or exploration in the Arctic.[158] Ultimately, central banks must ensure that all the most carbon-intensive and ecologically harmful investments are excluded from their non-monetary portfolios.

[151] Frank van Lerven (5 June 2018). "Central Banks Should Lead by Example on Transparency and Climate Change." New Economics Foundation. https://neweconomics.org/2018/06/central-banks-transparency

[152] Bank of England (June 2020). "The Bank of England's climate-related financial disclosure 2020." https://www.bankofengland.co.uk/-/media/boe/files/annual-report/2020/climate-related-financial-disclosure-report-2019-20.pdf?la=en&hash=5DA959C54540287A2E90C823807E089055E6721B

[153] Banco Central do Brasil (BCB) (2021). Source: https://www.bcb.gov.br/en/financialstability/sustainability

[154] See section 2.2, for an overview of Monetary Policy portfolios.

[155] Monetary reserves that are held on behalf of governments rather than as monetary policy tools would also fall under this section.

[156] NGFS (October 2019). Technical document: "A sustainable and responsible investment guide for central banks' portfolio management." https://www.ngfs.net/sites/default/files/medias/documents/ngfs-a-sustainable-and-responsible-investment-guide.pdf

[157] The policy involves a complete exit from coal by 2024, but as highlighted by Reclaim Finance, it does not prevent the BdF from investing in new coal projects between now and 2024. Source: Reclaim Finance (18 January 2021). "Quitting fossil fuels: the comeback of the Banque de France." https://reclaimfinance.org/site/en/2021/01/18/quitting-fossil-fuels-the-comeback-of-the-banque-de-france/

[158] Banque de France (18 January 2021). "Politique d'investissement responsable: renforcement des exclusions en matière d'énergies fossiles." Press release. https://www.banque-france.fr/sites/default/files/medias/documents/cp_politique_dinvestissement_responsable.pdf

Supporting and using taxonomies and standards

Taxonomies that define what assets and investments should be considered as sustainable or unsustainable are crucial for the implementation of many of the policies outlined above. For example, the EU has published a taxonomy for sustainable activities,[159] though there are serious concerns about its contents being influenced and watered down by industry lobbyists.[160] The latest draft Delegated Act on the EU sustainable taxonomy includes the burning of forest biomass, the manufacturing of hydrogen using coal and gas, and intensive livestock farming as sustainable activities.[161] In China, the PBoC only recently excluded 'clean coal' projects from its green bond standards.[162]

The development of sustainable and unsustainable taxonomies and standards should be the responsibility of democratically elected officials, and should benefit from extensive public consultation in addition to expert input. Central banks and supervisors can help stimulate this process by actively expressing the importance of these initiatives and playing a supportive role in their development. Once in place, taxonomies and standards should be used to inform the greening of monetary and financial policies as well as central banks' own portfolios.

Educating on environmental risk and green finance

Central banks and supervisors have a role to play in educating their own employees, private financial actors, and the wider public about environmental risk and green finance. This demonstrates their commitment to these issues and promotes understanding and action across their own community, the financial system, and the economy at large. For example, Indonesia's central bank and its Financial Services Authority have long coordinated seminars and capacity building workshops for bankers and supervisors on environmental risk assessment and green finance[163], and require that banks engage in external education on sustainable finance.[164] Similarly, the BoE has hosted workshops on climate-related financial risk for other central banks via the Centre for Central Banking Studies, and the Banca d'Italia runs internal training initiatives on environmental risk for its own employees.[165] An example of a central bank taking on an educational role with the wider public can be found in Brazil, where 'sustainable finance' is the subject of a thematic exposition in the Bank's Museum of Economy.[166]

Embedding environmental principles in day-to-day activities

Lastly, central banks must ensure that their working environment and day-to-day activities are as environmentally friendly as possible. Internal environmental policies and initiatives not only help to lower the immediate carbon and material footprint of institutions and their employees, but can also help to create a culture where employees increasingly consider the environmental implications of their work. Internal environmental policies have been implemented in multiple G20 central banks, such as the BdF [167], the Reserve Bank of Australia[168], and the Bank of Canada.[169]

[159] Source: "Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088." https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020R0852

[160] Paul Schreiber and Lucie Pinson (August 2020). "Behind the Curtains: When the Gas and Nuclear Lobbies Reshape the EU Sustainable Taxonomy." Media Briefing. Reclaim Finance. https://reclaimfinance.org/site/wp-content/uploads/2020/08/Reclaim-Finance-Media-Briefing-EU-Sustainable-Taxonomy-1.pdf

[161] Reclaim Finance (15 December 2020). "EU Taxonomy: 130 organisations call for science-based green finance rules." https://reclaimfinance.org/site/en/2020/12/15/eu-taxonomy-130-organisations-science-green-finance/

[162] Reuters (29 May 2020). "China excludes clean coal projects from list eligible for green bonds." https://www.reuters.com/article/us-china-environment-finance-idUSKBN2350FW

[163] Ulrich Volz (2015). "Towards a Sustainable Financial System in Indonesia." Inquiry into the Design of a Sustainable Financial System. https://eprints.soas.ac.uk/20419/3/Volz%202015%20Towards%20a%20Sustainable%20Financial%20System%20in%20Indonesia.pdf

[164] Financial Services Authority (OJK) (2017). Technical Guidelines for Banks on the Implementation of OJK Regulation. POJK Number 51/POJK.03/. https://www.ifc.org/wps/wcm/connect/13d863ef-b8cf-4584-8602-14a63f9b9ede/Technical+Guideline+on+the+Implementation+of+POJK+51+2017+on+SF_English.pdf?MOD=AJPERES&CVID=mGmKSQ

[165] The Bank of England and Banca d'Italia (the central bank of Italy) informed us of these initiatives via our bilateral interactions.

[166] Banco Central do Brasil (2021). Source: https://www.bcb.gov.br/en/financialstability/sustainability

[167] Banque de France (6 July 2018). "Reducing our environmental footprint." https://www.banque-france.fr/en/banque-de-france/corporate-social-responsibility/environmental-commitment/reducing-our-environmental-footprint

[168] Reserve Bank of Australia (2019). "Environmental Statement December 2019 - Commitment to the Environment." https://www.rba.gov.au/about-rba/our-policies/environmental-statement.html

[169] Bank of Canada (2021). "Greening the Bank of Canada." https://www.bankofcanada.ca/2019/11/greening-bank-canada/

Section 3: How green are G20 central banks?

This section explores the extent to which the world's major monetary and prudential authorities stack up against the ideal profile outlined above in section 2. We develop a criteria and scoring system for evaluating the green policymaking of G20 central banks and supervisors across the four key categories: *Research and Advocacy*, *Monetary Policy*, *Financial Policy*, and *Leading by Example*. Points are awarded for policies in each category according to their expected impact. An aggregated score is then assigned to each country[170] based on the performance of their monetary and prudential institutions across these categories, and all countries are placed in a final ranking, from which clear comparisons between countries can be drawn. We then identify key findings and discuss the implications of the study for central banks and supervisors, as well as civil society organisations and academics intending to influence policy outcomes.

3.1 Scoring system

Our scorecard scores and ranks G20 countries[171] based on the extent to which their monetary and prudential authorities have incorporated climate and nature-related considerations into their operations, research, and advocacy. Comparability between countries is maintained by assessing the division of powers and responsibilities between institutions in each country, and awarding points for green policies implemented across those institutions. For example, if a central bank does not have responsibility for prudential policymaking, or shares responsibility with other institutions, then the activities of relevant supervisors in that country are rated. Ultimately, one score is provided for each country based on the total expected impact of the policies and initiatives adopted by its monetary and prudential institutions.

The criteria and rating system for the scorecard has been developed based on the literature review above, as well as consultation with experts from civil society and academia. The scoring system is informed by the latest literature and expert opinions, and while this involves a degree of qualitative judgement, it allows for a useful representation of the relative progress of central banks and financial regulators on climate and nature-related issues.[172]

[170] The score for the European Union is included alongside the individual member states, and reflects the policy initiatives of the European Central Bank and the European Banking Authority. An overview of the scoring process used is provided in Box 2 on page 27.

[171] The G20 is made up of the European Union as well as the following 19 countries: Argentina, Australia, Brazil, Canada, China, Germany, France, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom and the United States. Focusing on the G20 leaves out some best practice examples of green central banking and supervision, but the priority in this project is to include the institutions whose decisions have the most significant global impact: those in the countries with the largest economies and most influence in global financial markets.

[172] Although scorecard does not account for differences in efficacy of policy implementation, the scoring system's inclusion of different policy stages and impact levels provides a good degree of granularity and comparability between the progress of different institutions. Comprehensive and detailed analyses of efficacy and impact would provide greater precision and comparability in assessing green policies, but would require assembling a significant range of comparable analyses of the impacts of green policies across the G20 countries, which is beyond the scope of this report.

Policy categories

All qualifying green policies have been placed into one of four categories: *Research* and *Advocacy*, *Monetary Policy, Financial Policy* and *Leading by Example*. Each country has been awarded points for discussing, committing to, or implementing green policies within those categories.

- ***Research and advocacy*** includes membership in the NGFS and environmental publications, such as articles, speeches, and research reports.
- ***Monetary policy*** includes green policies related to asset purchases and monetary reserves, collateral frameworks, funding and refinancing schemes, reserve requirements and interest rates, direct credit allocation, and coordination with fiscal authorities.
- ***Financial policy*** includes green policies related to disclosures and stress-testing, capital and liquidity instruments, and the regulation of financial institutions' impacts.
- ***Leading by example*** includes disclosing central banks' environmental risks, greening non-policy portfolios, supporting and using taxonomies and standards, educating on environmental risk and green finance, and embedding environmental principles in day-to-day activities.

Impact level

Within each of the four categories, green policies are further divided into three impact levels: high, medium, and low. Assigning policies to these impact levels ensures sufficient comparability in the scoring system.[173]

- ***High impact*** policies actively contribute to shifting financial flows away from all economic activity most responsible for causing the climate crisis: the extraction, processing and distribution of fossil fuels.
- ***Medium impact*** encompasses other policies that are likely to have a positive impact on financial flows. This includes policies that shift finance away from some carbon-intensive assets, but fall short of applying such incentives or restrictions to all fossil fuels. Policies that promote investment in green assets are also considered medium impact.
- ***Low impact*** represents small positive steps that fall short of having tangible long-term impact on the financial system, such as research reports, voluntary guidelines, and educational initiatives.

Policy stage

As implementation of new policy rarely happens in a short timeframe, institutions that have taken positive intermediate steps towards implementation of green policies are still awarded points. However, the amount of points awarded is adjusted to reflect the current stage of implementation. For each policy, one of three stages of development is assigned alongside impact level: under discussion, formal commitment, and fully implemented. The combination of both factors is used to determine at the appropriate score.

- ***Under discussion*** is the first stage.
- ***Formal commitment*** to a policy is the second stage.
- ***Fully implemented*** is the final stage.

Scoring policies

Within this framework, a high impact policy is valued twice as much as a medium impact policy, conveying its greater importance, and a low impact policy is valued at just 1 point when fully implemented, to convey its minimal importance. The specific amount of points awarded for all possible combinations of impact level and stage of implementation are shown in Table 1. The number of points have been calibrated to ensure the relative value of medium and high impact policies remains consistent across the stages of policy development.

[173] Existing theory and analysis on the impact of relevant policies allows us to assign a low, medium or high level of impact to each policy with a reasonable degree of confidence. Further granularity in the study would be made possible by comprehensive qualitative data on the impact of all the green policies considered.

Table 1: Points awarded for impact level and stage of implementation

	Low impact	Medium impact	High impact
Under discussion	0 points	1 point	2 points
Formal commitment	0 points	3 points	6 points
Fully implemented	1 point	5 points	10 points

Score limits

These four policy categories have each been assigned 'score limits'. Each category has two score limits: a category score limit, and a 'lesser impact' score limit.

- The ***category score limit*** for each category determines the maximum number of points institutions can earn in that category. Once the category score limit is reached, any additional policies in that category are not awarded points.
- The ***lesser impact score limit*** determines the maximum number of points institutions can earn for policies in that category that have relatively lower impact for that category. This score limit ensures that countries can only score full marks in a category if they have implemented at least one policy with the highest impact level in that category.

To ensure that concrete policies are valued higher than words, the *Research and Advocacy* category has a category score limit of 10 points, and the highest impact level for policies in this category is 'medium'. *Monetary Policy* and *Financial Policy* each have category score limits of 50 points (five times more than *Research and Advocacy*) because the core responsibilities and policy tools of central banks and supervisors fall under these two categories. While *Leading by Example* does not represent a core area of policy responsibility for central banks, it does include a small number of medium and high impact policies, and has therefore been assigned a category score limit of 20 points.

The four categories and their corresponding maximum score limits are shown collectively in table 2 below.

Table 2: Category score limits and lesser impact score limits

Policy category	Category score limit	Lesser impact score limit
Research and Advocacy	Policies score a maximum of 10 points.	Low impact policies score a maximum of 5 points.
Monetary Policy	Policies score a maximum of 50 points.	Low and medium impact policies score a maximum of 40 points.
Financial Policy	Policies score a maximum of 50 points.	Low and medium impact policies score a maximum of 40 points.
Leading by Example	Policies score a maximum of 20 points.	Low and medium impact policies score a maximum of 10 points.

The use of score limits, which can be reached with various combinations of policies, shape the final results in three important ways:

1. For institutions to achieve the highest scores within each category, they must have fully implemented high impact green policies within *Monetary Policy, Financial Policy* and *Leading by Example*, and be members of the NGFS.[174] This ensures institutions that have implemented large numbers of low or medium impact policies but no high impact policies are prevented from scoring highly.
2. For institutions to achieve a high aggregate score, they must take meaningful action to effect green policy across their operations, ensuring that only a well-rounded approach to incorporating environmental considerations into research, policies, and other activities can achieve a high score. If an institution were to focus only on greening monetary policy and refuse to take any other action, for example, it would not be able to perform particularly well in the scorecard.[175]
3. The scoring system can accommodate differing approaches to green policymaking, as reaching the maximum score in a given category can be achieved with various combinations of the eligible policies within that category.[176]

Total score

The amount of total points awarded across all four categories is the country's total score. Total scores can range from minimum of 0 points to a maximum of 130 points. A score of 0 indicates a complete absence of green policies or initiatives. A score of 130 indicates an exemplary approach to green policymaking: a balanced distribution of fully implemented green policies and initiatives across all four categories (with each including at least one higher impact policy).

Box 2: Approach to scoring the EU and EU member states

The scorecard ranks the EU as a whole, as well as the EU member nation states that are in the G20. In order to account for EU member states' delegation of certain responsibilities to the supranational level, all points awarded to the EU in the monetary and financial policy categories are also awarded to EU member states. These points are counted in addition to the points the latter receive for their own monetary and financial policies conducted at the national level.[177] In contrast, points awarded to the EU for policies that fall under *Research* and *Advocacy* and *Leading by Example* are *not added* to the scores of EU member states. EU member states only receive points in these two categories for initiatives and policies at the national level, and for actively contributing to certain EU level policies. Correspondingly, the EU only scores points in *Research* and *Advocacy* and *Leading by Example* for the policies and initiatives of EU level institutions, not those of national level institutions.

[174] Research and Advocacy contains no high impact policies, and membership in the NGFS is the only medium impact policy in the category.

[175] A further benefit of the score limits (resulting from the effects explained in points 1 and 2) is helping secure against the inadvertent greenwashing of institutions by the scorecard.

[176] Differences in which green policy decisions may be most optimal or appropriate can arise from the distinct policymaking traditions and varying macroeconomic contexts across institutions.

[177] The only exception to this rule is if points are awarded to the EU for a green policy that is 'under discussion' but a member state institution is actively opposing this policy. In this case, the opposing member state is not awarded any points for the discussion of the policy at the EU level, as they are arguing against the implementation of the policy.

Table 3 provides examples of policies eligible under each impact level in each category, based on the literature review in section 2. Given the vast range of green initiatives and policies that are available to central banks and supervisors, this list intends only to provide an indication of the types of policies considered in this scorecard and is therefore not exhaustive. In this and future editions of the scorecard, all green policies and initiatives implemented by central banks and supervisors will be qualitatively assessed in our scoring process to determine their category and impact level.

Table 3: A non-exhaustive list of point-scoring policies

Category	Policies
Research & Advocacy **(0-10 points)**	**Medium-impact:** Membership in the NGFS.[178] **Low-impact:** • A publicly available research report, financial or monetary stability review, academic article, working paper, newspaper article, or speech on climate or nature-related financial risk. • Hosted a conference on climate or nature-related financial risk. • Participation in a committee coordinating financial policymakers' response to climate change or other environmental threats. • Membership of relevant forums other than the NGFS, such as the Sustainable Banking Network. • Staff member chairs an NGFS workstream.
Monetary Policy **(0-50 points)**[179]	**High-impact:** • Exclusion of all fossil fuel assets[180] from collateral frameworks. • Higher reserve requirements for fossil fuel assets. • Exclusion of all fossil fuel assets from asset purchase programmes. • Exclusion of all fossil fuel assets from reserves held for monetary policy purposes. • Limits placed on fossil fuel lending. • Commercial banks required to charge higher interest rates (i.e. interest rate floor) on loans for all fossil fuel activities. • Monetary support for green fiscal spending and public finance institutions.[181] **Medium-impact:** • Partial exclusion of fossil fuel assets from collateral frameworks. • Haircuts assigned to/increased for fossil fuels or carbon-intensive assets.[182] • Green assets incorporated into collateral frameworks. • Lower interest rates for green lending in targeted funding and refinancing schemes. • Lower reserve requirements for green lending. • Partial exclusion of fossil fuel assets or other carbon-intensive assets from asset purchase programmes. • Minimum amount of required green lending. • Commercial banks are required to charge higher interest rates on loans to some fossil fuel or other carbon-intensive activities. • Commercial banks are required to charge lower interest rates for loans to green sectors. **Low-impact:** • Mandatory disclosure of climate-related risks for companies eligible in asset purchase schemes. • Sustainability-linked assets incorporated into collateral frameworks.
Financial Policy **(0-50 points)**	**High-impact:** • Higher risk-weights for new and existing fossil fuel exposures. • Sectoral leverage ratio calibrated to limit exposure to carbon-intensive assets. • Carbon countercyclical capital buffer. • Carbon-related large exposure restrictions. • Requirement for financial institutions to publish credible zero carbon targets and plans. **Medium-impact:** • Mandatory disclosure of environmental risks for financial institutions. • Requirement for financial institutions to incorporate environmental risks into risk management processes. • System-wide stress testing exercises that incorporate environmental risks. • Lower risk weights for low-risk green loans.[183] • Environmental considerations incorporated into the net stable funding factor. • Environmental considerations incorporated into the liquidity coverage ratio. • Environmental considerations incorporated into the supervisory review process. **Low-impact:** • Issuance of guidelines on the management of environmental risks. • Issuance of guidelines on integrating sustainable finance and/or environmental risk management into governance structures. • Issuance of guidelines on the development of sustainable finance products. • Establishment of a committee tasked with the supervision of environmental risks.
Leading by Example **(0-20 points)**	**High-impact:** • Sustainable investment policy with strong criteria related to the exclusion of fossil fuel assets from all non-monetary portfolios.[184] **Medium-impact:** • Sustainable investment policy with some criteria related to the exclusion of fossil fuel assets from non-monetary portfolios.[185] • Adoption of, or support for the development of, an unsustainable taxonomy. **Low-impact:** • Sustainable investment principles without any explicit exclusion of fossil fuel assets from non-monetary portfolios. • Adoption of, or support for the development of, a sustainable taxonomy. • Disclosure of environmental risks in monetary and non-monetary portfolios. • Reporting of environmental risks to elected officials. • Education initiatives on sustainable finance and environmental risk. • Events that allow civil society to engage the central bank on environmental issues.

[178] Where financial supervisors are also assessed, membership of the central bank alone is sufficient to qualify as medium impact. For example, in Australia, even though the Australian Prudential Regulation Authority is not a member, the Reserve Bank of Australia's membership scores the full 5 points of a medium impact policy.

[179] In cases where policies that we categorise under 'Monetary Policy' are implemented by a separate financial supervisor rather than the central bank, the points awarded for these policies are recorded under 'Financial Policy' rather than 'Monetary Policy'.

[180] We define "fossil fuel assets" as all financial assets tied to fossil fuel (oil, coal and gas) value chains—including extraction, refinement, and distribution—issued by companies that derive revenues from fossil fuel activities.

[181] For example, direct monetary financing for the purpose of green spending, purchase of green sovereign bonds, and funding sustainable investment by public banks and development finance institutions.

[182] We define "other carbon-intensive assets" as financial assets tied to activities that are heavily dependent on fossil fuel fuel value chains, and correspondingly have a high greenhouse gas emissions intensity, meaning a high level of emissions per unit of economic activity.

The data collection and score calculation process consisted of the following steps:

1. A first round of data was collected from central bank websites, secondary literature, and existing databases on this topic.
2. G20 central banks and supervisors were contacted with an opportunity to provide additional data on the activities and policies of their institutions.[186]
3. Informative replies from 11 institutions[187] and brief replies from 2 additional institutions[188] were incorporated into our database.
4. A preliminary set of results was circulated to a group of academic and civil society experts on green central banking and supervision.
5. Feedback and additional data from 8 experts was incorporated in order to produce the final set of results displayed in the following section.

[183] If certain classes of green assets are established to be lower risk than non-green counterparts, they should benefit from a lower risk weight. See, for example, the Hungarian central bank's policy on green housing: Leena Fatin (7 January 2020). "How the Hungarian Central Bank could help solve the energy efficiency puzzle: MNB goes for green on housing loans." Climate Bonds Initiative. https://www.climatebonds.net/2020/01/how-hungarian-central-bank-could-help-solve-energy-efficiency-puzzle-mnb-goes-green-housing

[184] Specifically, the exclusion of all assets tied to new fossil fuel projects and clear phase out plans from investment in companies that derive any revenue from fossil fuel projects. See, for example, Reclaim Finance's Coal Policy tool defining a strong coal phase out policy: https://coalpolicytool.org/our-demands-on-coal/

[185] This includes policies that exclude fossil fuels to some extent but allow for continued investment in new fossil fuel projects or in companies that derive revenues from fossil fuel activities. Policies that use alignment methodologies without any strong criteria for fossil fuel exclusion are also classified as medium impact.

[186] Non-responding institutions were contacted a second time.

3.2 Results: the scorecard

Table 4 displays each country's scores in each category, as well as in aggregate with a corresponding letter grade. Countries are ranked from highest to lowest aggregate score.

Table 4: G20 countries ranked by green monetary and financial policies

Rank	Country	Research and Advocacy *(out of 10)*	Monetary Policy *(out of 50)*	Financial Policy *(out of 50)*	Leading by Example *(out of 20)*	Aggregate Score *(out of 130)*	Grade *(A+ to F)*
1	China	10	16	24	0	50	C
2	Brazil	10	16	18	1	45	C-
3	France	10	3	22	8	43	C-
4	United Kingdom	10	4	19	5	38	D+
5	European Union	10	2	15	6	33	D+
6	Italy	10	2	15	4	31	D+
7	Germany	10	1	15	3	29	D
8	Indonesia	10	1	8	2	21	D
9	Japan	10	5	4	0	19	D-
10	Australia	10	0	4	1	15	D-
11=	Canada	10	0	2	1	13	D-
11=	Mexico	10	1	1	1	13	D-
13=	South Korea	10	0	1	0	11	D-
13=	United States	10	0	1	0	11	D-
15	India	3	5	1	0	9	F
16	Russia	5	0	1	2	8	F
17	South Africa	7	0	0	0	7	F
18	Turkey	1	0	3	0	4	F
19=	Argentina	0	0	0	0	0	F
19=	Saudi Arabia	0	0	0	0	0	F

Box 3: How would Switzerland fare in this ranking?

While Switzerland is not a G20 country, and is not included in the scorecard, the Swiss National Bank (SNB) is systemically important to the global financial system due to the size of its portfolios. Green policies implemented by the SNB could therefore have relatively high global impact. In the Appendix, we score the policies of the SNB and Swiss Financial Market Supervisory Authority (FINMA) alongside the G20 monetary and prudential authorities, awarding Switzerland 6 points in Research and Advocacy, 5 points in Monetary Policy, 7 points in Financial Policy, and 6 points in Leading by Example. This amounts to an aggregate score of 24 points, which would put Switzerland in eighth place in the ranking, below its European neighbours.

[187] Informative replies were provided by the Deutsche Bundesbank, the Bank of Italy, the European Banking Authority, the Bank of England, the Banking Regulation and Supervision Agency of Turkey, the Central Bank of Brazil, the Bank of Canada, the European Central Bank, and a joint response from the Reserve Bank of Australia, the Australian Prudential Regulation Authority, and the Australian Securities and Investments Commission.

[188] The Bank of Japan and Japan's Financial Services Authority.

3.3 Discussion

Our results show that G20 central banks and financial supervisors have a long way to go to being climate champions. While the majority achieved full marks on research and advocacy, they generally scored very poorly across the other three categories. In other words, their actions aren't living up to their words. In fact, we find that not a single 'high impact' policy has been implemented by any G20 monetary or prudential authority.[189] Even among the leaders in the scorecard, the majority of policies are focused on favouring green assets and industries, rather than restricting the primary drivers of climate change. While a handful of policies involve partly restricting financial flows to harmful industries, none of them disincentivise or place blanket restrictions on funding for fossil fuel activities. If central banks are going to play a meaningful role in tackling global emissions and ecological collapse, they must decisively move against fossil fuel industries and other harmful activities such as deforestation.

Based on our review of existing literature and our interactions with monetary and prudential authorities, we have identified three fundamental reasons for central banks' poor results in this first edition of the G20 Green Central Banking Scorecard:

- **First,** for most G20 central banks and supervisors, climate and ecological breakdown is still a relatively new topic and one which is technically challenging to deal with using their preferred toolkits and principles.[190] While they are increasingly recognising the importance of environmental risks, many have yet to build up knowledge and experience on this issue, and accept the need for exploring new initiatives, benchmarks, and tools. However, this is no excuse for lack of action. Given the urgency of these crises and existing knowledge regarding the high risk and damaging nature of certain activities, such as new fossil fuel projects, central banks and supervisors can and must take precautionary action now to steer financial flows away from such activities.

- **Second**, given their relatively short policymaking time horizons, central banks and supervisors place greater weight on short-term transition risks than longer term physical risks in their decision-making. This bias is evident, for example, in the NGFS climate scenarios' focus on 2 degree Celsius scenarios rather than 1.5 degree scenarios, which would involve greater transition risks but lower physical risks.[191] In fear of provoking the onset of transition risks, they are delaying the implementation of ambitious policies. In reality, however, central banks and supervisors can and must generate policies that would ensure a smooth and orderly transition of the financial system.

- **Third**, 'market-fixing' approaches, such as voluntary disclosures of climate risks, still tend to be favoured among central banks and supervisors over more proactive 'market-shaping' policies.[192] For example, in our bilateral interactions, one supervisor stated that their "banking sector has followed a market-led route to green banking." Many central bankers and supervisors are not yet comfortable with the idea that they have a duty to implement the more interventionist policies that a growing contingent of academics and civil society organisations are proposing.[193]

Another striking result is that the top two countries in the ranking are two of the countries with the most significant environmental issues in the world. Brazil's deforestation is rampant,[194] while China is renowned for its high levels of air, water and soil pollution.[195] Nevertheless, these countries' institutions are ranked above those in multiple other countries that have less severe environmental crises within their borders. Why are these countries' institutions performing better than multiple others that appear to have less severe environmental crises within their borders?

[189] Evidenced by the data available in the Appendix.

[190] For example, the principle of 'market neutrality' is a barrier to implementing proactive green monetary policy.

[191] Romain Ioualalen, Paul Schreiber (February 2021). "NGFS Scenarios: Guiding Finance Towards Climate Ambition Or Climate Failure?" Reclaim Finance and Oil Change International.
https://reclaimfinance.org/site/wp-content/uploads/2021/02/NGFS-scenarios-final.pdf

[192] Josh Ryan-Collins (March 2019). "Beyond voluntary disclosure: why a 'market-shaping' approach to financial regulation is needed to meet the challenge of climate change." SUERF Policy Note, Issue No 61. https://www.suerf.org/docx/f_a821a161aa4214f5ff5b8ca372960ebb_4805_suerf.pdf

[193] OMFIF found that "central banks participating in our survey were generally less enthusiastic about the prospect of market-shaping actions" and that "many expressed concerns about these more direct methods of climate risk supervision that use unconventional prudential and monetary tools." Source: https://www.omfif.org/wp-content/uploads/2020/02/Tackling-Climate-Change.pdf

[194] See, for example: BBC (30 November 2020). "Brazil's Amazon: Deforestation 'surges to 12-year high'." https://www.bbc.co.uk/news/world-latin-america-55130304

[195] See, for example: Deng Tingting (2 June 2017). "In China, the water you drink is as dangerous as the air you breathe." The Guardian.
https://www.theguardian.com/global-development-professionals-network/2017/jun/02/china-water-dangerous-pollution-greenpeace

China and Brazil are both rich in natural resources, and significant environmental harm has been generated in the exploitation of these resources, driven in large part by overconsumption within the high-income economies of countries in the Global North.[196] From this perspective, central banks and supervisors in China, Brazil and other countries in the Global South are facing more of an uphill battle than their counterparts in high income economies, as environmental harms have been highly concentrated in countries across the Global South. This makes environmental impacts and risks more immediately visible and relevant for their central bankers and supervisors, and may result in a greater impetus to green their policymaking processes. Finally, we should consider the time difference between the announcement of policies, their implementation, and the eventual realisation of their positive environmental impact.[197] We provide case studies of China, Brazil and France in Box 4 that examine the varying reasons for their relative success, and note their respective key areas for improvement.

Box 4: Case Studies of the Top 3 Countries in the Scorecard

#1 - China

Total score: 50/130

Relevant institutions: The PBoC is China's monetary authority and was also the country's banking regulator until 2003, when the China Banking Regulation Commission (CBRC) was set up to take over functions related to the regulation of banks. In 2018, the CBRC merged with the China Insurance Regulation Committee (CIRC) to form the China Banking and Insurance Regulation Committee (CBIRC).

Reasons for relative success: The PBoC's first green initiative dates back to 1995, when it issued its "Notice on Implementing Credit Policies and Enhancing Environmental Protection" which provided guidance for banks on "how to better include environmental variables in credit decisions."[198] Progress accelerated as of 2007 when the PBoC, CBRC and the State Environmental Protection Agency issued their "Opinions on Implementing Environmental Protection Policies and Rules and Preventing Credit Risks", which required banks to consider environmental risks in credit operations and shift lending away from dirty activities and towards more environmentally friendly projects.[199]

Since then, the CBRC / CBIRC has implemented a series of financial policies aimed at promoting green finance. Recently issued CBIRC guidelines relate to environmental risk management systems, Environmental, Social, and Corporate Governance (ESG) related disclosures, the establishment of green finance divisions, and more.[200] Equally, the PBoC has started introducing green monetary policies, such as its "Notice Regarding Promoting Credit Asset and Collateral in Central Bank Evaluation", which established the acceptance of green bonds with AA rating as collateral in the PBoC's medium term lending facility and green loans in the Standing Lending Facility. Additionally, in 2018, the PBoC started offering a favourable interest rate on required reserves for banks that perform well in an assessment of green financing activities.[201]

China's relative success in this scorecard compared to its G20 counterparts is likely linked to its monetary and prudential authorities' close coordination with other government departments. For example, in 2016, the PBOC, CBRC and CIRC issued the world's first national green finance policy—the "Guidelines for Establishing the Green Financial System"—in collaboration with 4 other government institutions. Additionally, the PBoC and CBIRC have not shied away from policies that seek to actively steer financial markets in a green direction, whereas many central banks have taken more passive approaches, often in the name of 'market neutrality'. [202]

Key areas for improvement: Despite leading in our ranking, the PBoC and CBIRC have a long way to go (as demonstrated by their total score of 50/130), especially as China has experienced a marked slowdown in its green finance activities over the past year.[203] A key area of improvement for the PBoC is the further development of green monetary policy measures. For example, Ma Jun (2021) recently proposed a strengthening of the mechanism by which banks that are performing well environmentally are offered a favourable interest rate on required reserves.[204] Measures aimed at penalising the financing of environmentally harmful activities must also be implemented.

The most urgent priority, however, is for the PBoC and CBIRC to show leadership in working with other departments to improve China's green finance standards. While 'clean coal' was recently removed from green bond taxonomy,[205] it remains present in the National Development and Reform Commission's (NDRC) Green Industry Guidance Catalogue,[206] which is used in the implementation and assessment of green finance practices. The concept of 'clean coal' is a dangerous myth and has no place in green taxonomies.[207]

#2 - Brazil

Total score: 45/130

Relevant Institutions: The Banco Central do Brasil (BCB) is Brazil's central bank and supervisor. The National Monetary Council is in charge of formulating monetary legislation and is currently composed of the Governor of the BCB, the Minister of Finance, and the Minister of Planning, Development and Management.

Reasons for relative success: The BCB's first green policy—requiring financial institutions to acquire evidence of compliance with environmental regulations from borrowers seeking rural credit in the Amazon—was implemented in 2008 and produced a positive impact on deforestation rates.[208] The following year a new piece of monetary legislation restricted financing for crop expansion in the Amazon and other environmentally sensitive regions.[209] Across the G20, this is the only policy that actively and explicitly banned the financing of a type of environmentally harmful activity. In more recent years, the BCB's green policies have focused on environmental risk management, including the incorporation of environmental risks into the "Internal Process of Capital Adequacy Assessment", and requiring financial institutions to implement a Policy for Socio-Environmental Responsibility.

The BCB's latest major development came in September 2020, when it announced the Sustainability pillar of its Agenda BC#, which includes commitments to a wide range of policies over the next few years. This includes, among other initiatives, the establishment of a 'Green Liquidity Facility' and a 'Green Bureau' for rural credit, climate stress tests, and disclosure of the institutions' own socio-environmental risks.[210]

Key areas for improvement: The BCB appears to be on the right track, but its BC# Sustainability Agenda does not involve any measures to restrict the financing of environmentally harmful activities or any exclusion of assets linked to such activities from monetary policy operations. Additionally, the BCB must

[196] Christian Dorninger et al. (January 2021). "Global patterns of ecologically unequal exchange: Implications for sustainability in the 21st century." Ecological Economics, Vol. 179. https://www.sciencedirect.com/science/article/abs/pii/S0921800920300938

[197] For example, a portion of Brazil's points in our scoring system were allocated for policies announced in 2020 that have not yet been implemented.

[198] June Choi, Donovan Escalante and Mathias Lund Larsen (August 2020). Discussion Brief: "Green Banking in China – Emerging Trends: With a spotlight on the Industrial and Commercial Bank of China". Climate Policy Initiative. https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf

[199] Virginia Harper Ho (15 February 2018). "Sustainable Finance & China's Green Credit Reforms: A Test Case for Bank Monitoring of Environmental Risk." Cornell International Law Journal, Vol. 51. https://www.lawschool.cornell.edu/research/ILJ/upload/Ho-final.pdf

[200] Leena Fatin (13 January 2020). "China Banking & Insurance Regulatory Commission make new moves to support greening of financial system." Climate Bonds Initiative. https://www.climatebonds.net/2020/01/you-have-love-china%E2%80%99s-banking-regulator-cbirc-they%E2%80%99ve-just-announced-big-push-banks-have

[201] June Choi, Donovan Escalante and Mathias Lund Larsen (August 2020). Discussion Brief: "Green Banking in China – Emerging Trends: With a spotlight on the Industrial and Commercial Bank of China". Climate Policy Initiative. https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf

[202] See, for example, Box 1 on "The Myth of Market Neutrality".

[203] Mathias Lund Larsen (22 February 2021). "How China's green finance slowdown threatens global climate ambitions." South China Morning Post. https://www.scmp.com/comment/opinion/article/3122533/how-chinas-green-finance-slowdown-threatens-global-climate

[204] Ma Jun (2021). "Improve the green financial system with the goal of carbon neutrality." Financial Times. https://mp.weixin.qq.com/s/6ToLdxGdsKSY3d7eMVODUg

[205] Leena Fatin (10 June 2020). "Regulators combine and issue single green projects catalogue: Simplification expected to attract additional international investment." Climate Bonds Initiative. https://www.climatebonds.net/2020/06/chinas-top-regulators-announce-they-will-exclude-fossil-fuels-their-green-bonds-taxonomy-it

[206] NDRC (2019). Green Industry Guidance Catalog (2019 Edition), Annex 1. https://www.ndrc.gov.cn/fgqz/hjyzy/stwmjs/201903/W020200217416444788586.pdf

[207] Fred Pearce (30 October 2008). "Time to bury the 'clean coal' myth." The Guardian. https://www.theguardian.com/environment/2008/oct/30/fossilfuels-carbonemissions

[208] Juliano Assunção, Clarissa C. e Gandour, and Romero Rocha (January 2013). Executive Summary: Does Credit Affect Deforestation? Evidence from a Rural Credit Policy in the Brazilian Amazon. Climate Policy Initiative.
https://climatepolicyinitiative.org/wp-content/uploads/2013/01/Does-Credit-Affect-Deforestation-Executive-Summary-English.pdf

[209] Banco Central do Brasil (2021). Social and environmental responsibility. https://www.bcb.gov.br/en/about/socialresponsibility

[210] Banco Central do Brasil. Sustainability BC#. https://www.bcb.gov.br/en/financialstability/sustainability

ensure that its policies are effectively implemented on the ground.[211] In the context of the current Bolsonaro government, the prospects for social progress and environmental policy in Brazil are weak,[212] but this only increases the need for the BCB to green its own operations and the financial system it regulates.

#3 - France

Total score: 43/130

Relevant Institutions: The BdF is France's central bank and houses the Autorité de Contrôle Prudentiel et de Résolution (ACPR),[213] which supervises French banks and insurance companies. Additionally, the ECB operates EU level monetary policy and supervises all European banks, while the EBA is the EU-wide regulator.

Reasons for relative success: France has performed well in this scorecard relative to G20 counterparts for two basic reasons: (i) at the EU level, the ECB and the EBA have recently stepped up their environmental efforts; and (ii) within the EU, the BdF has stood out with policies that go further than other EU member states.

At the EU level, recent environmental efforts have been accelerated both by the EU Parliament seeking to implement legislation that supports its 'Green Deal' [214] and by Christine Lagarde becoming President of the ECB.[215] Relevant legislation passed by the EU Parliament includes the Capital Requirements Regulation's requirement for the EBA to assess the case for differential prudential treatment of exposures related to environmental objectives,[216] and mandatory sustainability-related disclosures in the financial services sector.[217] Examples of ECB policies that have scored points for both the EU and EU member states in this scorecard include requirements for financial institutions to integrate environmental risks into risk management practices,[218] and the acceptance of sustainability-linked bonds as collateral in Eurosystem operations.[219]

At the national level in France, recent examples of leadership include the ACPR's climate stress test exercise conducted with a significant portion of France's major banking and insurance groups, with results scheduled to be published in April 2021.[220] The BdF's most recent developments included the strengthening of its sustainable investment charter for its own portfolios,[221] which already included criteria on the exclusion of fossil fuels,[222] and discussion related to alignment of collateral policy with climate targets.[223] As the BdF hosts the NGFS Secretariat, it is unsurprising to see it pushing ahead on this agenda.

Key areas for improvement: A key priority for the BdF is to advocate for the kind of policies it has discussed and applied to its own portfolios to be applied rapidly at the European level.[224] Alignment of the ECB's asset purchase programmes and collateral operations with environmental targets would represent a significant step forward in green central banking.[225] Thus far, the focus within the EU has remained within the realms of stress testing, disclosures, and risk management. A shift towards more proactive market-shaping policies that penalise and restrict dirty investment, while providing clear incentives (such as Green TLTROs[226]) for green investment, is a necessary next step. While the EBA is exploring the case for differential prudential treatment of exposures related to environmental objectives, their report on this matter is only due in 2025.[227] The BdF and ACPR should contribute to accelerating progress on this issue.

Moving forward, a clear takeaway is that aligning monetary and financial policy with environmental objectives must be a key overarching priority for central banks and financial regulators across the board. Ambitious measures, such as excluding fossil fuels from collateral frameworks and assigning higher risk-weights to fossil fuel exposures, are the kinds of policies that will significantly improve countries' scores in the G20 green central banking scorecard. While further research and advocacy is generally positive, this will not earn additional points for the majority of the institutions assessed here. It is time for central banks and financial regulators to move beyond words and act decisively to align their operations—and the financial systems they oversee—with the Paris Agreement.

[211] Two experts consulted for this project expressed concerns that some of BCB's policies may not be effectively implemented on the ground.

[212] See, for example: Sue Branford and Thais Borges (1 February 2021). "Brazil guts agencies, 'sabotaging environmental protection' in the Amazon: Report." Mongabay. https://news.mongabay.com/2021/02/brazil-guts-agencies-sabotaging-environmental-protection-in-amazon-report/

[213] The Prudential Supervision and Resolution Authority.

[214] Financial Stability, Financial Services and Capital Markets Union (published 8 March 2018, updated 5 August 2020). "Renewed sustainable finance strategy and implementation of the action plan on financing sustainable growth." European Commission. https://ec.europa.eu/info/publications/sustainable-finance-renewed-strategy_en

[215] Martin Arnold and Alexander Vladkov (3 January 2021). "Christine Lagarde expected to make ECB a climate change pioneer." Financial Times. https://www.ft.com/content/00d5dc18-b95d-4a15-b936-e87c98fb17fc

[216] European Banking Authority (2021). Article 501c. https://www.eba.europa.eu/regulation-and-policy/single-rulebook/interactive-single-rulebook/101647

[217] EUR-Lex (2021). Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (Text with EEA relevance). PE/87/2019/REV/1. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R2088

[218] ECB (27 November 2020). "ECB publishes final guide on climate-related and environmental risks for banks." Press Release. https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr201127~5642b6e68d.en.html

[219] European Central Bank (22 September 2020). "ECB to accept sustainability-linked bonds as collateral." Press Release. https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200922~482e4a5a90.en.html

[220] Autorité de contrôle prudentiel et de résolution (ACPR) (2021). "Scenarios and main assumptions of the ACPR pilot climate exercise." Banque de France. https://acpr.banque-france.fr/sites/default/files/medias/documents/20200717_main_assumptions_and_scenarios_of_the_acpr_climate_pilot_exercise.pdf

[221] Banque de France (19 January 2021). "Responsible investment policy: reinforcing exclusions with regard to fossil fuels." Press Release. https://www.banque-france.fr/en/communique-de-presse/responsible-investment-policy-reinforcing-exclusions-regard-fossil-fuels

[222] For a critical review of the BdF's responsible investment policy, see: Reclaim Finance (18 January 2021). "Quitting fossil fuels: the comeback of the Banque de France." https://reclaimfinance.org/site/en/2021/01/18/quitting-fossil-fuels-the-comeback-of-the-banque-de-france/

[223] See, for example, this working paper co-authored by the Deputy Director of Monetary Policy Implementation: Antoine Oustry et al (December 2020). Climate-related Risks and Central Banks' Collateral Policy: a Methodological Experiment. Banque de France. https://www.banque-france.fr/sites/default/files/wp790.pdf

[224] While the Governor of the BdF has publicly suggested that the ECB should shift away from market neutrality and align its monetary policy operations with climate targets, both the timeline proposed (3 to 5 years) and the alignment target (2 degrees Celsius rather than 1.5) lack ambition. See:

Reclaim Finance (23 February 2021). "Banque de France: what is its position on the decarbonisation of the ECB?" https://reclaimfinance.org/site/en/2021/02/23/banque-de-france-position-decarbonisation-ecb/

[225] New Economics Foundation, Positive Money Europer, and 350.org (April 2020). "The ECB and climate change: outlining a vision for success." Policy briefing. https://neweconomics.org/uploads/files/ecb-climate-change1a.pdf

[226] Jens van 't Klooster and Rens van Tilburg (September 2020). "Targeting a sustainable recovery with Green TLTROs." Positive Money Europe and Sustainable Finance Lab. https://www.positivemoney.eu/wp-content/uploads/2020/09/Green-TLTROs.pdf

[227] European Banking Authority (6 December 2019). "Action plan of sustainable finance." https://www.eba.europa.eu/sites/default/documents/files/document_library/EBA%20Action%20plan%20on%20sustainable%20finance.pdf

CONCLUSION

The results of the green central banking scorecard underscore the importance of civil society's call to action for monetary and prudential policymakers to green their operations and support the transition to a sustainable economy. While twelve of the G20 countries achieved full marks for policies that fall under *Research and Advocacy*, the scorecard reveals a universal absence of high impact policies that target reductions in financial support for fossil fuel activities from all G20 central banks and supervisors.

We consider this universal policy shortfall to be the most important finding of this report, and we hope that the stark result is met with recognition from central banks and supervisors that publishing reports and giving speeches is not enough. As public institutions with mandates that cannot be fulfilled without environmental considerations, it is imperative that they clean up their act and step up the pace and scale of their green policymaking. Crucially, this report highlights that encouraging the growth of more green economic activity is no substitute for institutions winding down their support of all the fossil fuel intensive and ecologically harmful aspects of our financial system.

Furthermore, our report shows primary concerns expressed by central banks and commentators about the prospect of 'going green'—that it would threaten the independence of central banks and invalidate their supposed 'market neutrality'—are misguided. Faced with the prospect of climate and ecological breakdown, 'market neutrality' serves as little more than a facade to paper over the inherently political nature of policy decisions made by central banks, and current approaches focused on climate-related disclosures and stress tests are insufficient. Global financial markets have repeatedly failed to deliver climate-safe outcomes, and will continue to do so until central banks and supervisors enact policies that reshape the financial system to better serve people and planet.

APPENDIX

For further information about the data in the tables below, please contact **david.barmes@positivemoney.org.uk**

Note that *Research & Advocacy* sections are in most cases not comprehensive, as data entry was paused once the maximum score of 10 for that category was achieved.

ARGENTINA

Central Bank of Argentina

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
0/10	0/50	0/50	0/20
0/130			

AUSTRALIA

Reserve Bank of Australia and Australian Prudential Regulation Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - RBA is a member of the NGFS **Low impact:** - Debelle, 2019 (speech) - October 2019 Financial Stability Review - October 2020 Financial Stability Review - February 2020 Statement on Monetary Policy - Working Group on Financial Implications of Climate Change (referred to in our bilateral interactions)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - Climate change financial risk vulnerability assessment (formal commitment) **Low impact:** - APRA is embedding climate risk into supervisory activities, including encouragement of TCFD disclosures (referred to here) - ESG-related update to the Prudential Practice Guide (formal commitment)	**High impact:** - N/A **Medium Impact:** - N/A **Low impact**: - Internal environmental policy
10/10	0/50	4/50	1/20
15/130			

BRAZIL

Banco Central do Brasil

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Key references for this table: the BCB's BC# Sustainability page and its Social and Environmental Responsibility page **Medium impact:** - Member of NGFS **Low impact:** - Memorandum of understanding with the Climate Bonds Initiative - 2020 conference on sustainability regulatory initiatives - October 2020 Financial Stability Report - NGFS interview with Fernanda Nechio - Campos Neto 2020 presentation on the Brazilian Economic Outlook and Agenda BC#	**High impact:** - N/A **Medium impact:** - Ban on financing for sugar cane crop expansion in the Amazon, Pantanal and other zones - Condition on rural credit in the Amazon whereby borrowers must show proof of environmental compliance (study on impact on deforestation) - 'Green Liquidity Facility' (formal commitment) - 'Green Bureau of Rural Credit' and incentives for green rural credit (formal commitment) **Low impact:** - Sustainability criteria in the management of international reserves (formal commitment)	**High impact:** - N/A **Medium impact:** - Mandatory incorporation of exposure to S&E risks in the Internal Capital Adequacy Assessment Process (ICAAP), including disclosure of exposure to S&E risks - Financial institutions are required to to implement a Policy for Socio-Environmental Responsibility that is proportional to its exposure to environmental risks and to its relative importance to the financial sector - Financial institutions are required to incorporate socio-environmental risks into their risk management and governance structures - Inclusion of climate risk scenarios in new and improved stress tests (formal commitment) **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** -N/A **Low impact:** - Disclosure of BCB's socio-environmental risks (formal commitment) - Thematic exposition of 'sustainable finance' at the Bank's Museum of Economy (formal commitment) - Reduction of the environmental impact of the cash cycle (formal commitment) - Management Plan on Sustainable Logistics and Policy for Socio-Environmental Responsibility
10/10	16/50	18/50	1/20
45/130			

CANADA

Bank of Canada, Office of the Superintendent of Financial Institutions

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Member of NGFS **Low impact:** - Ens and Johnston, 2020 (staff discussion paper) - Macklem, 2020 (speech) - Molico, 2019 (report) - 2019 Climate Change and Central Banking Workshop - Lane, 2017 (speech)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Pilot climate stress test (includes only a small groups of institutions) - OSFI launched a consultation on climate-related risks in the financial sector	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Internal environmental policy
10/10	0/50	2/50	1/20
13/130			

CHINA

People's Bank of China, China Banking and Insurance Regulatory Committee

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - PBoC is a member of NGFS **Low impact:** - Co-convened the Green Finance Task Force (referred to here) - PBoC convenes the Green Finance Committee (referred to here) - 2015 Recommendations on Establishing China's Green Financial System (prefaced the issuance of China's Guidelines for Establishing the Green Financial System, which is the national overarching policy document setting out some of the policies listed in this table) - Ma Jun chairs an NGFS workstream - Ma Jun 2021 paper on improving the green financial system with the goal of carbon neutrality	**High impact:** - N/A **Medium impact:** - Banks must offer reduced interest rates for loans to pollution control facilities, environmental protection and infrastructure, renewable energy, etc (referred to here) - PBoC's Notice Regarding Promoting Credit Asset and Collateral in Central Bank Evaluation established Green bonds, loans, and securities with an AA rating and above accepted as collateral in medium-term lending facility and green loans accepted as part of the standing lending facility (referred to here) - Interest rate provided to banks on required reserves may be increased if the bank is assessed to be greener in the PBoC's macroprudential assessments (referred to here) **Low impact:** - PBoC issued Notice on Issues Relating to Improving Environmental Protection in Credit Policy, which provided guidance for banks on "how to better include environmental variables in credit decisions" (referred to here)	**High impact:** - N/A **Medium impact:** - Banks are required to incorporate environmental risks into risk management and governance processes (see, for example, 2012 Notice on Issuing Green Credit Guidelines, referred to here) - Bank are required to shift lending towards environmentally friendly projects (see, for example, 2007 "Opinions on Implementing Environmental Protection Policies and Rules and Preventing Credit Risks" and the 2012 "Notice on Green Credit Guidelines" referred to here) - Banks are required to shift lending away from unsustainable projects (see, for example, 2007 "Opinions on Implementing Environmental Protection Policies and Rules and Preventing Credit Risks" and the 2012 "Notice on Green Credit Guidelines" referred to here) - Mandatory climate risk disclosure for all financial firm (under discussion) - Lower risk weights for green assets (under discussion - referred to here) **Low impact:** - CBRC issued Opinions on Energy Efficiency and Emission Reductions in Credit Extension, which provided "specific guidance on how banks can contribute to national environmental goals" (referred to here) - CBRC's Notice of Submission of Green Credit Statistics requires that the 21 main banks report green credit statistics (referred to here) - CBRC Notice of the Key Performance Indicators of Green Credit Implementation, which established "quantitative and qualitative indicators for assessing performance" (referred to here) - CBIRC issued guidelines on incorporating ESG requirements into the entire credit granting process (referred to here) - CBIRC is encouraging banks to set up green finance divisions and branches and develop green financial products (referred to here) - CBIRC issued guidelines on ESG-related information disclosure, reporting and interaction with stakeholders (referred to here) - CBIRC issued guidelines on environmental risk management system (referred to here)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - PBoC, CSRC, NDRC announced updated green bond guidelines which now exclude 'clean coal' (referred to here), but the Green Industry Guidance Catalogue still includes 'clean
10/10	16/50	24/50	0/20
50/130			

EUROPEAN UNION

European Central Bank and European Banking Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - ECB and EBA are members of the NGFS **Low impact:** - Lagarde, 2021 (speech) - Lagarde, 2020 (speech) - Schnabel, 2020 (speech) - May 2019 Financial Stability Review - Frank Elderson is Chair of the NGFS	**High impact:** - N/A **Medium impact:** - Incorporating cimate considerations into corporate bond purchase programme (under discussion) **Low impact:** - ECB accepts sustainability-linked bonds as collateral	**High impact:** - N/A **Medium impact:** - Mandatory disclosure of sustainability risks - Banks are required to integrate climate and environmental risks into risk management practices - 2022 climate stress test will focus on climate-related risks (formal commitment) - Differential prudential treatment of exposures related to environmental objectives (under discussion at EBA - required by CRR) **Low impact:** - EBA launched a consultation to incorporate ESG risks into the governance, risk management and supervision of credit institutions and investment firms	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Contributed to development of the EU taxonomy - Runs ECB Listens event which allows civil society to raise environment-related questions - Sustainable and responsible investment practices in the management of their non-monetary portfolios (referred to here) - Annual environmental statement - Contribution to the IMF's green bond fund - Establishment of a climate change centre - Climate stress test of Eurosystem balance sheet (under discussion - referred in our bilateral interactions) - Disclosure of own climate risks (formal commitment)
10/10	2/50	15/50	6/20
33/130			

FRANCE

Banque de France, Autorité de Contrôle Prudentiel, European Central Bank, European Banking Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Banque de France (including ACPR) is a member of the NGFS **Low impact:** - Oustry et al., 2020 (working paper) - Bolton et al., 2020 (book) - June 2019 Financial Stability Review - 2019 conference on climate change and finance - Morgan Després is Head of the NGFS Secretariat	**High impact:** -N/A **Medium impact:** - Incorporating climate considerations into corporate bond purchase programme (under discussion at ECB) - Climate-related adjusments to collateral policy (assumed to be under discussion given that Oustry et al., 2020 is co-authored by the Deputy Director of the Monetary Policy Implementation Directorate, and the February 2021 speech by Villeroy de Galhau supported "reducing climate risk in concrete terms, through our asset purchases and collateral policies") **Low impact:** - ECB accepts sustainability-linked bonds as collateral	**High impact:** - N/A **Medium impact**: - Mandatory sustainability-related disclosure in the financial services sector - Banks are required to integrate climate and environmental risks into risk management practices - ACPR has conducted a climate stress test on the main French banking and insurance groups - ECB 2022 climate stress test will focus on climate-related risks (formal commitment) - Differential prudential treatment of exposures related to environmental objectives (under discussion at EBA - required by CRR) **Low impact:** - ACPR issued a guide on good practices in the governance and management of climate-related risks by French banking institutions - EBA launched a consultation to incorporate ESG risks into the governance, risk management and supervision of credit institutions and investment firms - Mandatory carbon reporting specifically for French institutional investors	**High impact:** - N/A **Medium impact:** - Responsible investment charter for non-monetary portfolios that includes explicit exclusionary policies for fossil fuels **Low impact:** - Contributed to the development of the EU taxonomy - Internal environmental policy - Awards a prize for young researchers in green finance - Disclosure of own climate risks (formal commitment)
10/10	3/50	22/50	8/20
43/130			

GERMANY

Deutsche Bundesbank, European Central Bank, European Banking Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Bundesbank is a member of NGFS **Low impact:** - 2020 conference on climate change, pandemics, and monetary policy - Mauderer, 2020 (speech) - Weidmann, 2020 (speech) - 2019 Financial Stability Review - Sabine Mauderer chairs an NGFS workstream	**High impact:** - N/A **Medium impact:** - Incorporation of climate considerations into asset purchase programmes is under discussion at the ECB but the Bundesbank has largely opposed this Low impact: - ECB accepts sustainability-linked bonds as collateral	**High impact:** - N/A **Medium impact:** - Mandatory sustainability-related disclosure in the financial services sector - Banks are required to integrate climate and environmental risks into risk management practices - ECB 2022 climate stress test will focus on climate-related risks (formally committed) - Differential prudential treatment of exposures related to environmental objectives (under discussion at EBA - required by CRR) Low impact: - EBA launched a consultation to incorporate ESG risks into the governance, risk management and supervision of credit institutions and investment firms	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Contributed to the development of the EU taxonomy - Disclosure of own climate risks (formal commitment) - internal environmental policy - ESG principles in some non-monetary portfolios
10/10	1/50	15/50	3/20
29/130			

INDIA

Reserve Bank of India

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - N/A **Low impact:** - January 2021 RBI Bulletin - April 2020 RBI Bulletin - 2019 report on trend and progress of banking	**High impact:** - N/A **Medium impact:** - The Priority Sector Lending programme imposes a minimum credit floor on lending to certain environmentally friendly sectors **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Issued a circular to all commercial bank on CSR, sustainable development, and non-financial reporting	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
3/10	5/50	1/50	0/20
9/130			

INDONESIA

Bank Indonesia, Otoritas Jasa Keuangan

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Bank Indonesia and OJK are members of the NGFS **Low impact:** - Setijawan, 2019 (working paper) - OJK is a member of the SBN - Signed Memorandum of Understanding with the Environment Ministry in 2014 - Co-hosted 2005 National Workshop on the Roles and Benefits of Sustainable Development from Banking Perspectives - OJK published its Sustainable Finance Roadmap Phase II (2021 - 2025)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - BI issued voluntary Green Lending Model Guidelines for Mini Hydro Power Plant Projects (referred to here)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - OJK issued a Clean Energy Handbook for Financial Insistitutions OJK's guidelines for banks include: - integration environmental factors into risk management - sustainable finance targets and submission of an annual sustainable finance action plan as well as a sustainability report to OJK - checking if borrowers have a valid environmental license - development sustainable finance products and/ or services and build the human resources necessary to run sustainable finance programmes - allocation of a portion of CSR funds to support the implementation of sustainable finance - integration of sustainable finance into vision, mission, governance, etc - Engagement in external education on sustainable finance	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Guidelines and incentives for green bond issuance - BI and OJK coordinated seminars and workshops for bankers and supervisors on environmental risk assessment and green finance (referred to here) - Development of a green taxonomy (formal commitment)
10/10	1/50	8/50	2/20
21/130			

ITALY

Banca d'Italia, European Central Bank, European Banking Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Banca d'Italia is a member of NGFS **Low impact:** - Signorini, 2020a (speech) - Signorini 2020b (speech) - Member of the Italian Natural Capital Committee - Visco, 2019 (speech) - 2020 Financial Stability report	**High impact:** - N/A **Medium impact:** - Incorporating climate considerations into corporate bond purchase programme (under discussion at ECB) **Low impact:** - ECB accepts sustainability-linked bonds as collateral	**High impact:** - N/A **Medium impact:** - Mandatory sustainability-related disclosure in the financial services sector - Banks are required to integrate climate and environmental risks into risk management practices - ECB 2022 climate stress test will focus on climate-related risks (formally committed) - Differential prudential treatment of exposures related to environmental objectives (under discussion at EBA - required by CRR) **Low impact:** - EBA launched a consultation to incorporate ESG risks into the governance, risk management and supervision of credit institutions and investment firms	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Contributed to the development of the EU taxonomy - Disclosure of own climate risks (formal commitment) - Sustainable investment policy for non-monetary portfolios (referred to here and in our bilateral interactions) - Internal training initatives on climate and environmental risk (referred to in our bilateral interactions) - Annual environmental report
10/10	2/50	15/50	4/20
31/130			

JAPAN

Bank of Japan and Financial Services Authority Japan

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - BoJ and FSA are members of NGFS **Low impact:** - Bank of Japan hosted an International Research Workshop on Climate-Related Financial Risks - Kuroda, 2020 (speech at National Association for Business Economics) - Furukawa et al., 2020 (working paper) - FSA launched Japan's TCFD consortium - Ikeda, 2019 (article)	**High impact:** - N/A **Medium impact:** - Loan Support Program offers loans at below market rate to financial institutions to support priority lending sectors including environment business **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - FSA guidance toward green sectors (formal commitment referred to here) **Low impact:** - Climate stress test pilot (formal commitment) - TCFD consortium issued guidance for climate-related disclosures	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
10/10	5/50	4/50	0/20
19/130			

MEXICO

Banco de Mexico, Comision National Bancaria y de Valores

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Banco de Mexico and CNBV are members of NGFS **Low impact:** - December 2020 Financial Stability Report (presentation version) - Diaz de Leon, 2020 (presentation) - Fanjul, 2020 (report) - Diaz de Leon, 2019 (speech) - Hosted NGFS Steering Committee meeting in January 2019	**High impact:** - N/A **Medium impact:** - Inclusion of data on individuals and businesses sanctioned by the Federal Environmental Protection Agency in credit analysis (under discussion) **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - Measures related to climate and environmental risk identification, assessment, and disclosure (under discussion) **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Incorporation of SRI principles into fixed-income holdings in own portfolios (referred to here) - Develop definitions and standards for green loans, bonds, and infrastructures (under discussion)
10/10	1/50	1/50	1/20
13/130			

RUSSIA

Bank of Russia

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Member of NGFS **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Bank of Russia ran a consultation on the impact of climate change on the financial sector	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Standards on the issuance of green bonds - Recommendation on Responsible Investment
5/10	0/50	1/50	2/20
8/130			

SAUDI ARABIA

Saudi Arabian Monetary Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
High impact: - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
0/10	0/50	0/50	0/20
0/130			

SOUTH AFRICA

South African Reserve Bank

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Member of NGFS **Low impact:** - Arndt et al., 2020 - Contributed to the publication of a technical paper on "Financing a Sustainable Economy"	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
7/10	0/50	0/50	0/20
7/130			

SOUTH KOREA

Bank of Korea, FSS Korea, FSC Korea

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Bank of Korea is a member of NGFS **Low impact:** - 2018 report on climate change and financial risks (referred to here) - FSC Korea leads Green Finance Taskforce - Sohn Byungdoo speech at launch of Green Finance Taskforce - FSS hosts an international conference on green financing - Yoon Suk-heun speech at the conference on green financing	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Climate stress testing tool - Efforts to boost investment in green industries (formal commitment referred to here)	**High impact:** - N/A **Medium impact:** **Low impact:** - Prevent greenwashing and market confusion by specifying green industries (formal commitment referred to here)
10/10	0/50	1/50	0/20
11/130			

SWITZERLAND

Swiss National Bank, Swiss Financial Market Supervisory Authority

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - SNB and FINMA are members of NGFS **Low impact:** - Maechler and Moser, 2019 (speech)	**High impact:** - N/A **Medium impact:** - Exclusion of all companies primarily active in coal mining operations from portfolios held for monetary policy purposes **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - Financial institutions are required to incorporate climate-related financial risks into risk management processes - Mandatory disclosure of climate-related financial risks for financial institutions (under discussion - see FINMA's consultation on transparency obligations for climate risks) - Climate stress test (under discussion) **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - Exclusion of all companies primarily active in coal mining operations from portfolios held for investment purposes **Low impact:** - Internal environmental policy
6/10	5/50	7/50	6/20
24/130			

TURKEY

Central Bank of the Republic of Turkey, Turkey Banking Regulation and Supervision Agency

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - N/A **Low impact:** - The Banking Regulation and Supervision Agency is a member of the SBN	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** **Low impact:** - BRSA raised LTV ratio from 80% to 90 for housing with class A energy performance certificate % and 85% for housing with class B (low impact because the measure was only in place for a few months before all LTV ratios were raised in response to COVID) - In 2018, BRSA conducted the "Turkish Banking Sector Sustainability Survey" presenting basic issues, concepts, tools and global trends as well as a stocktaking of sustainability-related capacity, policies and activities of banks in Turkey (referred to in our bilateral interactions) - The final report detailing the survey results was shared with banks' relevant staff and highest level executives directly responsible for sustainability issues (referred to in our bilateral interactions)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
1/10	0/50	3/50	0/20
4/130			

UNITED KINGDOM

Bank of England

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Member of NGFS **Low impact:** - Carney, 2018 (speech) - Breeden, 2020 (speech) - Batten et al., 2016 (working paper) - Batten, 2018 (working paper) - Sarah Breeden chairs an NGFS workstream	**High impact:** - N/A **Medium impact:** - Decarbonisation of CBPS (formal commitment) **Low impact:** - Due Diligence Questionnaires on collateral holdings (referred to in our bilateral interactions)	**High impact:** - N/A **Medium impact:** - Mandatory TCFD disclosure for banks and insurers - Financial institutions are required to integrate climate risk into their risk management practices - 2021 Climate Biennial Exploratory Scenario **Low impact:** - Supervisory statement on climate risks issued to banks and insurers - Framework for assessing climate risks issued to the insurance industry - 2019 insurance stress test, which included risks from climate change - PRA co-convenes the CRFR, which has published guides for financial institutions on climate issues	**High impact:** - N/A **Medium Impact:** - N/A **Low impact:** - 2020 Climate-Related Financial Disclosure - Convened a citizens' panel on climate change - Ran workshops on managing climate-related financial risks for other central banks through the Centre for Central Banking Studies (referred to in our bilateral interactions) - Set up a working group to facilitate investment in productive finance, including green finance - Greener bank programme
10/10	4/50	19/50	5/20
38/130			

UNITED STATES

The Federal Reserve

Research & Advocacy	Monetary policy	Financial policy	Leading by Example
Medium impact: - Member of NGFS **Low impact:** - Federal Reserve Bank of San Francisco Conference on the Economics of Climate Change - Brainard, 2019 (speech) - November 2020 Financial Stability Report - Brainard, 2021 (speech) - Rudebusch, 2021 (economic letter)	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - Creation of a Supervision Climate Committee	**High impact:** - N/A **Medium impact:** - N/A **Low impact:** - N/A
10/10	0/50	1/50	0/20
11/130			

307 Davina House
137-149 Goswell Road
London
EC1V 7ET
0207 253 3235

www.positivemoney.org
www.positivemoney.eu

Positive Money is a not-for-profit company limited by guarantee, registered in England and Wales.

Company Number 07253015