



POLICY BRIEF  
**ADDRESSING CLIMATE-  
RELATED FINANCIAL RISKS  
AND OVERCOMING BARRIERS  
TO SCALING-UP SUSTAINABLE  
INVESTMENT**



Task Force 2  
**CLIMATE CHANGE AND ENVIRONMENT**

Authors  
**IRENE MONASTEROLO, ULRICH VOLZ**

# موجز السياسة مواجهة المخاطر المالية المتعلقة بالمناخ والتغلب على العقبات التي تعرض زيادة حجم الاستثمار المستدام

فريق العمل الثاني  
تغير المناخ والبيئة



المؤلفون  
إيرين موناستيرولو، أولريش فولز



## ABSTRACT

Climate change represents a material risk for individual financial institutions and systemic financial stability. Moreover, there is increasing awareness that finance plays a crucial role in achieving the global climate targets. However, to date, climate risks are not sufficiently accounted for, hindering sustainable investments. To align finance with sustainability and safeguard macro-financial stability, it is crucial to adequately assess forward-looking climate risks for lending and investment decisions. The Group of Twenty should support efforts by central banks, financial supervisors, international financial organizations, and the financial sector to integrate climate and sustainability factors into risk management and advance the mainstreaming of sustainable finance.

يمثل التغير المناخي خطرًا ماديًا بالنسبة إلى استقرار المؤسسات المالية الفردية والتمويل المُنظَّم. وعلاوة على ذلك، فهناك وعي متزايد بأن التمويل يلعب دورًا في غاية الأهمية في تحقيق الأهداف المناخية العالمية. ورغم ذلك، لم تحظ المخاطر المناخية باهتمامٍ كافٍ حتى اللحظة؛ ما يؤدي إلى تراجع الاستثمارات المستدامة. ومن أجل مواءمة التمويل مع الاستدامة والحفاظ على الاستقرار المالي الكلي، سيكون التقييم الاستشراقي المناسب للمخاطر المناخية أمرًا في غاية الأهمية بالنسبة إلى قرارات الإقراض والاستثمار. ينبغي لمجموعة العشرين أن تدعم جهود البنوك المركزية وجهات الإشراف المالي ومؤسسات التمويل العالمية والقطاع المالي من أجل دمج عوامل المناخ والاستدامة في إدارة المخاطر، وتمكين عملية التمويل المستدام.



## CHALLENGE

Climate change represents a material risk for individual financial institutions and systemic financial stability (Carney 2015). Nevertheless, financial actors have not yet priced climate risks (and opportunities) into financial contracts (e.g., loans, bonds, and equity holdings; see e.g., Monasterolo and de Angelis 2020). This is despite the increasing availability of consolidated approaches to embed forward-looking climate risks into financial risk valuation, such as climate stress tests (Battiston et al. 2017). The mispricing of climate-related financial risks delays the scaling-up of investments in the low-carbon activities needed to achieve climate targets. In addition, it leaves investors exposed to assets of carbon-intensive businesses, which could lose value and become stranded in a disorderly transition to a low-carbon economy (Battiston et al. 2017).

The finance sector should play a crucial role in achieving the global climate targets. However, currently, sustainable investments are hindered for several reasons. These include the lack of an operative sustainability taxonomy and the lack of mainstreaming climate-financial risk assessment in investors' portfolios (Berensmann et al. 2017; Monasterolo 2020). To align finance with sustainability and safeguard macro-financial stability, it is crucial to adequately assess forward-looking climate risks for lending and investment decisions.

Sustainable finance has developed from a niche market that attracted a small number of ethical lenders and investors to an area that generates considerable interest across the financial system. The growing interest in sustainable finance can be attributed to the rising awareness of climate-related financial risks. These include physical risks related to more frequent extreme weather events and chronic climate impacts, as well as transition risks, which originate from sudden changes in climate policy and regulation or technological changes (Carney 2015; NGSF 2019; Semieniuk et al., forthcoming). Sustainable financing instruments—such as Environmental, Social, and Governance (ESG) products and green bonds—have developed rapidly in the last decade. However, they still represent a small share of the global securities market (EIB 2019; Climate Bonds Initiative 2019). Such instruments target investments aligned with climate and other sustainability targets, and provide an opportunity to finance sustainable, low-carbon transition.

## CHALLENGE

The main barriers to align portfolios with sustainability goals include the lack of (i) a consistent, operative taxonomy to classify investments according to their shades of “green” and “dirty,” (ii) disclosure of climate-related financial risks, (iii) mainstreaming of climate-risk assessment in financial contracts and portfolios, and (iv) stable and coherent policy measures to foster low-carbon transition.

Financial data firms do not provide consistent ESG ratings (Busch, Johnson, and Pioch 2018; Berg, Kölbl, and Rigobon 2019). The European Commission (EC) has introduced a sustainability taxonomy; however, this has not yet been implemented. The lack of standardized classification prevents investors from disclosing environmental and climate risks and from pricing the risks and opportunities stemming from alternative portfolios’ allocations. In addition, it prevents financial supervisors from quantitatively assessing financial institutions’ exposure to climate-related financial risks and from identifying prudential measures—such as a revision in capital requirements for banks that are highly exposed to carbon-intensive firms—to mitigate such risks. Moreover, current monetary and fiscal policy approaches do not differentiate between sustainable and conventional financial instruments.



## PROPOSAL

Mainstreaming climate-financial risk assessment in financial contracts is crucial for developing financial instruments that bridge the sustainable investment gap (Siaba Serrate 2019) and promote financial stability (Battiston, Mandel, and Monasterolo 2019). This is an essential step to achieve the Paris Agreement climate and energy targets, although meeting climate change goals requires greater actions, including carbon pricing. Financing the global energy transition and sustainable development requires a fundamental change in the current local and global financial architecture. It needs to be facilitated by sustainable financial governance (e.g., UNEP Inquiry 2016; Volz 2017; Dikau and Volz 2020), which the Group of Twenty (G20) members will need to support. This is particularly relevant amid the COVID-19 crisis where the pandemic's risks can interact with climate and financial risks. This amplifies losses and decreases countries' ability to build resilience to risks. The G20 should build on the important work of the Green Finance Study Group and the Sustainable Finance Study Group (G20 2016). It should support efforts by central banks, financial supervisors, international financial organizations—including the International Monetary Fund (IMF) and multilateral development banks (MDBs)—and the financial sector to integrate sustainability factors into risk management and mainstream sustainable finance. Importantly, the G20 should stimulate a larger discussion among the policy and academic community. It should support the work of the Central Banks and Supervisors Network for Greening the Financial System (NGFS) to help mitigate climate-related financial risks and overcome bottlenecks to scaling-up sustainable finance.

Below, we propose nine actions that the G20 should take to align financial systems with the UN's climate and sustainability targets.

### **1. Support the development and implementation of a standardized taxonomy for investments based on their climate and sustainability impact.**

This would reduce market uncertainty regarding the climate-alignment of individual investments; thus, informing investments' strategies in the low-carbon transition and contributing to scaling-up low-carbon investments. Despite its shortcomings, the EC's Sustainable Finance Taxonomy is an ambitious undertaking to support investors, companies, issuers, and project promoters in navigating the transition to a low-carbon, resilient, and resource-efficient economy (EC 2020). It can also serve as an example for other jurisdictions. However, it will be important to develop and implement criteria for not only green investments but also "dirty" investments.

## **2. Promote standards for the disclosure of climate and other sustainability risks across the financial sector.**

This is necessary to enable the development of reliable approaches to analyze forward-looking climate and other sustainability risks. Establishing transparent ESG and climate reporting standards that are aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) would facilitate the development and issuance of sustainable financial products and provide important signals to financial investors. International cooperation among supervisors is desirable to ensure basic common standards and facilitate sustainable finance and investment, globally. International cooperation among financial supervisors should be fostered to ensure basic common standards for implementing disclosure in investors' portfolios and facilitate sustainable finance and investment globally.

## **3. Introduce science-based climate-financial risk assessment in public and private investors' risk management strategies.**

Scientific research on climate stress testing considers multiple scenarios associated with different low-carbon transition pathways (including a disorderly transition) and assesses the largest losses for financial institutions conditioned to such scenarios (NGFS 2020; Ma, Caldecott, and Volz 2020). Integrating climate risk into financial risk metrics (e.g., value at risk) and assessing the largest losses that an investor could face—conditioned to different climate transition scenarios via climate stress testing—is fundamental to inform their risk management strategies (Battiston et al. 2017). This would allow banks and other financial actors to integrate climate risk into their financial risk valuation, thus informing portfolio risk management strategies in the low-carbon transition (Bolton et al. 2020). It would also allow financial supervisors to assess investors' exposure to losses driven by potential carbon stranded assets, conditioned to several climate transition scenarios (including those characterized by a disorderly transition). They can design tailored prudential measures to mitigate such risks at the level of individual financial firms and the financial sector at large (NGFS 2020). Overall, climate-financial risk assessment would provide a signal to the market and promote the stable development of sustainable finance instruments.

## **4. Integrate sustainability risks into the Basel IV framework.**

The current Basel supervision standards do not require financial institutions to assess and report climate- and other sustainability-related risks. Hence, they do not mandate financial institutions to take necessary prudent actions. For example, building up additional capital buffers to mitigate such risks. More importantly, neither banks' internal nor third party rating methodologies have adequately incorporated climate-related and other sustainability risks.

### **5. Decarbonize portfolios of central banks and public financial institutions.**

Central banks and public financial institutions may also be heavily exposed to transition risks through their exposure to carbon-intensive assets on their balance sheets. Following the 2008 financial crisis, major central banks, including the Fed, European Central Bank (ECB), Bank of England, and Bank of Japan, more than doubled the size of their balance sheets with asset purchase programs. This was without having a clear objective on climate change risks (Battiston and Monasterolo 2019b). A thorough assessment of the climate transition risk exposure of the ECB's Quantitative Easing program and of the carbon risk of central banks' portfolios—along with the greening of their collateral policies and appropriate deleveraging measures—needs to be implemented.

### **6. Integrate science-based climate-financial risk assessments into the operational frameworks of international financial institutions.**

Several international financial institutions, including the IMF and the World Bank, have already started examining many of the aforementioned issues. However, they still need to comprehensively integrate climate- and other sustainability-related risks in their country and project risk assessments. As announced by the IMF's managing director, the IMF should incorporate climate-risk analysis and climate stress testing in its Article IV consultations with member countries. It should also incorporate such analyses in its annual Global Financial Stability Reports. The IMF and the World Bank should also include climate stress tests in their joint Financial Sector Assessment Programs (Monasterolo and Volz 2020). All MDBs and development finance institutions (DFIs) should assess climate-related financial risks and opportunities in their financial operations, price climate risks into financial contracts, and conduct regular climate stress tests. This will help them realize their financial stability and sustainable development mandates and foster climate-aligned investments (Monasterolo and Volz 2020). Leading by example, international financial organizations could set new standards for best practices for financial management and raise awareness of the importance of addressing climate risks across financial markets.

### **7. Scale-up sustainable finance for developing countries through MDBs and DFIs.**

While domestic resource mobilization is key to financing sustainable development, MDBs and DFIs can provide important support in financing sustainable and climate-resilient infrastructure. Moreover, they can support the development of local currency bond markets that should be aligned with sustainable finance principles. They can encourage the adoption of sustainable finance practice in local financial markets, as a tool for financial market deepening. Against the backdrop of deteriorating public finances due to the COVID-19 crisis, the G20 should enhance the lending



capacity of MDBs and DFIs by raising capital. The scaling-up of sustainable finance in developing countries by MDBs and DFIs should be consistent with the United Nations' Sustainable Development Goals. This approach would align financial proceeds with the sustainability and climate pledges of developing countries and assure coherence between investments and sustainability targets.

#### **8. Develop sustainable insurance solutions and boost resilience investment to support countries that are particularly vulnerable to climate change.**

Climate-vulnerable developing countries are particularly exposed to climate-related financial risks. Thus, both governments and corporates face a climate-risk premium on the cost of capital (Buhr et al. 2018; Kling et al., forthcoming; Beirne et al. 2020). Simultaneously, these countries face a large insurance gap. Many financial instruments and physical assets are either not insured or under-insured against climate- and other sustainability-related risks. The G20 should continue to support climate-vulnerable developing countries through initiatives to develop insurance solutions and climate-risk models that can guide national adaptation strategies. For example, the InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance (Jarzabkowski et al. 2019). Moreover, MDBs and DFIs should increase their support for climate-vulnerable countries through investments in climate adaptation and resilience to help them reduce disaster risk and yield dividends from resilience (Tanner et al. 2015; GCA 2019).

#### **9. Foster cooperation between financial supervisory authorities, scientific research, and civil society.**

Central banks and financial supervisors have recognized the need to price climate risks into financial contracts and run climate stress tests to assess the largest climate-related losses for investors' portfolios (NGFS 2019). Several central banks and financial supervisors have started to collaborate with climate and financial academics to apply science-based methods to assess investors' exposure to climate transition risks via their bonds' portfolios. This collaboration aims to analyze exposure to climate transition risks—including those stemming from a disorderly transition to a low-carbon economy—and the implications on individual and systemic financial risks. Examples of such collaboration include the European Insurance and Occupational Pension Fund Authority (Battiston et al. 2019), the Austrian National Bank (Battiston and Monasterolo 2019a), and Banco de Mexico (Roncoroni et al. 2019). In addition, think-tanks have supported financial supervisors in assessing the degree of alignment of investments with the climate targets, partnering with, for example, the Bank of

England and the California Insurance Commissioner (2°ii, 2020). The G20 should make a concerted effort to advance policy-relevant research nationally and internationally. It should encourage research-policy cooperation to advance methods and improve prudential frameworks to mitigate climate- and other sustainability-related risks.

### **Key Recommendations**

The G20 should support efforts by central banks, financial supervisors, international financial organizations, and the financial sector to integrate climate and sustainability factors into risk management and advance the mainstreaming of sustainable finance. We propose nine action points:

1. Operationalize a standardized taxonomy for investments based on their climate and sustainability impact by building on science-based research
2. Promote standards for the disclosure of climate and sustainability risks across the financial sector
3. Mainstream science-based climate-financial risk assessment in public and private investors' risk management
4. Integrate sustainability risks into the Basel IV framework
5. Decarbonize portfolios of central banks and public financial institutions
6. Integrate science-based climate-financial risk assessment into the operational frameworks of international financial institutions
7. Scale-up sustainable finance for developing countries through MDBs and DFIs
8. Develop sustainable insurance solutions and boost resilience investment to support countries that are particularly vulnerable to climate change
9. Foster cooperation between financial supervisory authorities, scientific research, and civil society

**Disclaimer**

This policy brief was developed and written by the authors and has undergone a peer review process. The views and opinions expressed in this policy brief are those of the authors and do not necessarily reflect the official policy or position of the authors' organizations or the T20 Secretariat.



## REFERENCES

2°ii (2° Investing Initiative). 2020. Paris Agreement Capital Transition Assessment, Paris et al: 2 Degrees Investing Initiative. Accessed August 6, 2020. <https://www.transitionmonitor.com/about>.

Battiston, Stefano, Antoine Mandel, and Irene Monasterolo. 2019. "CLIMAFIN Handbook: Pricing Forward-Looking Climate Risks Under Uncertainty." SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3476586>.

Battiston, Stefano, Petr Jakubik, Irene Monasterolo, Keywan Riahi, and Bas van Ruijven. 2019. "Climate Risk Assessment of Sovereign Bonds' Portfolio of European Insurers." In EIOPA, Financial Stability Report, December. Frankfurt: European Insurance and Occupational Pension Authority.

Battiston, Stefano, Antoine Mandel, Irene Monasterolo, Franziska Schütze, and Gabriele Visentin. 2017. "A Climate Stress-test of the Financial System." *Nature Climate Change* 7 (4): 283–288.

Battiston, Stefano, and Irene Monasterolo. 2019a. "A Climate Risk Assessment of Sovereign Bonds' Portfolio." SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3376218>.

Battiston, Stefano, and Irene Monasterolo. 2019b. "How Could the ECB's Monetary Policy Support the Sustainable Finance Transition?" FINEXUS Working Paper. Zurich: FINEXUS Center for Financial Networks and Sustainability, University of Zurich.

Beirne, John, Nuobu Renzhi, and Ulrich Volz. 2020. "Feeling the Heat: Climate Risks and the Cost of Sovereign Borrowing." ADBI Working Paper No. 1159. Tokyo: Asian Development Bank Institute.

Berg, Florian, Julian F. Kölbel, and Roberto Rigobon. 2019. "Aggregate Confusion: The Divergence of ESG Ratings." SSRN Electronic Journal. <https://dx.doi.org/10.2139/ssrn.3438533>.

Berensmann, Kathrin, Ulrich Volz, Isabella Alloisio, Celine Bak, Amar Bhattacharya, Gerd Leipold, Hannah Schindler et al. 2017. "Fostering Sustainable Global Growth through Green Finance – What Role for the G20?" Last modified April 12, 2017. [https://www.g20-insights.org/wp-content/uploads/2017/04/Climate\\_Green-Finance\\_V2.pdf](https://www.g20-insights.org/wp-content/uploads/2017/04/Climate_Green-Finance_V2.pdf).

## REFERENCES

Bolton, Patrick, Morgan Despres, Luiz Awazu Pereira da Silva, Frederic Samama, and Romain Svartzman. 2020. *The Green Swan: Central Banking and Financial Stability in the Age of Climate Change*. Basel and Paris: Bank for International Settlements and Banque de France.

Buhr, Bob, Ulrich Volz, Charles Donovan, Gerhard Kling, Yuen Lo, Victor Murinde, and Natalie Pullin. 2018. *Climate Change and the Cost of Capital in Developing Countries*. Geneva and London: UN Environment, Imperial College London and SOAS University of London.

Busch, Timo, Matthew Johnson, and Thomas Pioch. 2020. "Corporate Carbon Performance Data: Quo Vadis?" *Journal of Industrial Ecology*. <https://doi.org/10.1111/jiec.13008>.

Carney, Mark. 2015. "Breaking the Tragedy of the Horizon: Climate Change and Financial Stability." Speech given at Lloyd's of London by the Governor of the Bank of England, London, September 29, 2015.

Dikau, Simon, and Ulrich Volz. 2020. "Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance." Department of Economics Working Paper No. 232. London: SOAS University of London.

EC (European Commission). 2020. "Taxonomy: Final report of the Technical Expert Group on Sustainable Finance." Brussels: European Commission.

GCA (Global Commission on Adaptation). 2019. *Adapt Now: A Global Call for Leadership on Climate Resilience*. Washington, DC: Global Commission on Adaptation.

G20. 2016. "G20 Green Finance Synthesis Report G20." Last modified July 15, 2016. <https://www.tralac.org/images/News/Documents/G20/G20%20Green%20Finance%20Synthesis%20Report%20July%202016.pdf>

Jarzabkowski, Paula, Konstantinos Chalkias, Daniel Clarke, Ekhosuehi Iyahan, Daniel Stadtmueller, and Astrid Zwick. 2019. "Insurance for Climate Adaptation: Opportunities and Limitations." Last modified August 22, 2019. [https://www.researchgate.net/profile/Paula\\_Jarzabkowski/publication/335321823\\_INSURANCE\\_FOR\\_CLIMATE\\_ADAPTATION OPPORTUNITIES AND LIMITATIONS/links/5d5e7ea7a6fdcc55e81f56eb/INSURANCE-FOR-CLIMATE-ADAPTATION- OPPORTUNITIES-AND-LIMITATIONS.pdf](https://www.researchgate.net/profile/Paula_Jarzabkowski/publication/335321823_INSURANCE_FOR_CLIMATE_ADAPTATION OPPORTUNITIES AND LIMITATIONS/links/5d5e7ea7a6fdcc55e81f56eb/INSURANCE-FOR-CLIMATE-ADAPTATION- OPPORTUNITIES-AND-LIMITATIONS.pdf).

## REFERENCES

Kling, Gerhard, Ulrich Volz, Victor Murinde, and Sibel Ayas. Forthcoming. "The Impact of Climate Vulnerability on Firms' Cost of Capital and Access to Finance." *World Development*.

Ma, Jun, Ben Caldecott, and Ulrich Volz (eds). 2020. *Environmental Risk Assessment for Financial Institutions*. Paris: Central Banks and Supervisors Network for Greening the Financial System.

Monasterolo, Irene. 2020. "Climate Change and the Financial System." *Annual Review of Environment and Resources* 12: 1–24.

Monasterolo, Irene, and Luca de Angelis. 2020. "Blind to Carbon Risk? An Analysis of Stock Market Reaction to the Paris Agreement." *Ecological Economics* 170: 1–10.

Monasterolo, Irene, and Ulrich Volz. 2020. "The IMF and Climate Change: An Operative Agenda for Financial Stability." SOAS Centre for Sustainable Finance Working Paper. London: SOAS University of London.

NGFS. 2020. *NGFS Handbook of Environmental Risk Analysis for Financial Institutions*. Paris: Central Banks and Supervisors Network for Greening the Financial System.

Roncoroni, Alan, Stefano Battiston, Luis O. L. E. Farfàn, and Serafin Martinez Jaramillo. 2019. "Climate Risk and Financial Stability in the Network of Banks and Investment Funds." *SSRN Electronic Journal*. <https://dx.doi.org/10.2139/ssrn.3356459>.

Semieniuk, Gregor, Emanuele Campiglio, Jean-Francois Mercure, Ulrich Volz, and Neil R. Edwards. Forthcoming. "Low-carbon Transition Risks for Finance." *WIREs Climate Change*.

Siaba Serrate, José. 2019. "Turning Sustainable Finance into Mainstream Finance." Last modified March 31, 2019. <https://t20japan.org/wp-content/uploads/2019/03/t20-japan-tf2-2-turning-sustainable-finance-into-mainstream-finance.pdf>.

Tanner, Thomas, Swenja Surminski, Emily Wilkinson, Robert Reid, Jun Rentschler, and Sumati Rajput. 2015. *The Triple Dividend of Resilience. Realising Development Goals Through the Multiple Benefits of Disaster Risk Management*. London and Washington, DC: Overseas Development Institute and World Bank.

## REFERENCES

UNEP Inquiry. 2016. "The Financial System We Need. From Momentum to Transformation." Last modified October 2016. [http://unepinquiry.org/wp-content/uploads/2016/09/The\\_Financial\\_System\\_We\\_Need\\_From\\_Momentum\\_to\\_Transformation.pdf](http://unepinquiry.org/wp-content/uploads/2016/09/The_Financial_System_We_Need_From_Momentum_to_Transformation.pdf)

Volz, Ulrich. 2017. "On the Role of Central Banks in Enhancing Green Finance." Inquiry Working Paper No. 17/01. Geneva: UN Environment Inquiry into the Design of a Sustainable Financial System.



## **AUTHORS**

**Irene Monasterolo**

Vienna University of Economics and Business

**Ulrich Volz**

SOAS, University of London



