CLIMATE SUSTAINABILITY WORKING GROUP (CSWG) G20 2022

# INNOVATIVE FINANCE TOWARDS LOW GREEN HOUSE GAS (GHG) EMISSION AND CLIMATE RESILIENCE FUTURE

## Final Report

September 2022

G20 INDONESIA 2022

# STUDY 3.1

# INNOVATIVE FINANCE TOWARDS LOW GREEN HOUSE GAS (GHG) EMISSION AND CLIMATE RESILIENCE FUTURE

**Indonesia, September 2022**

Recover Together, Recover Stronger


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unicef for every child

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GGGI

NDC PARTNERSHIP

# Acknowledgments


### Authors

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### Contributors

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1 The paper was written by Dr. Christoph Nedopil

# Executive Summary

To put the world on track with the objectives of the Paris Agreement and the 2030 Agenda and truly achieve this transition, the world needs a systemic transformation of finance involving all public and private stakeholders in government, business, and society with no easy silver bullet of a single finance instrument.

G20 members representing over 85% of the world's GDP, around two thirds of its population and responsible for about 75% of greenhouse gas emissions, have a key role to play in addressing these challenges holistically and provide direction for leaders, regulators, business executives, investors, non-governmental organizations, and all societies.

Finance from both public and private sources needs to be mobilized and shifted from unsustainable to green activities. The G20 members need to scale up climate-friendly finance and investments, reduce counterproductive subsidies, create barriers for non-aligned investments through broader key policy actions, and benefit by accelerating technology solutions and industrial development programs of green energy, food systems, social infrastructure, sustainable trade and resilient infrastructure, etc. Scaling up investments in sustainable activities will yield and boost productivity and generate powerful co-benefits such as protecting ecosystems and biodiversity in both the short and long runs.

Therefore, advancing enablers and solutions of climate finance that leverage all kinds of existing and innovative finance instruments and mechanisms is critical to financing green and sustainable transition. Finance will have to be invested smartly, with focused rigor in terms of the climate benefits whilst also maximizing socio-economic co-benefits to achieve a just transition addressing particularly vulnerable groups.

The study is developed for the G20 Climate Sustainability Working Group (CSWG) and addresses actions within the areas of innovative climate finance that drive smart policy-finance interaction for mitigation and adaptation finance, as well as sustainable development more broadly to include social aspects.

The study recognizes previous G20 and ongoing work on climate and green finance and is informed by discussions within related working groups e.g., Sustainable Finance Working Group (SFWG), Development Working Group (DWG), and other studies within CSWG e.g., Study 3.2 on carbon economic value and adds distinct content. This study further benefited from consultation meetings and responses to a questionnaire sent from G20 members[2].

2 The study received survey response from Indonesia, Japan, Mexico, Russia, Saudi Arab, UK, and USA.

| | SFWG | DWG | CSWG Study on Carbon Economic Value | CSWG Study on Climate finance |
|---|---|---|---|---|
| Target audience | • Financial regulators | • Development | • Environmental ministries, market regulators | • Environmental/ climate ministries |
| Key content | • Transition finance<br>• Improving credibility of financial institutions<br>• Scaling of sustainable finance instruments | • Development finance instruments | • Emission Trading Scheme, carbon tax pricing, voluntary carbon markets | • Public -private finance nexus<br>• Policy-finance nexus, e.g., for harmonized standards<br>• Climate-nature nexus<br>• Development and social aspects |

The findings of this study to drive smart climate policy-finance interaction with a focus on ministries responsible for climate and environment under the premise to race to the top and leave no one behind while recognizing local differences are as follows:

- Improving interoperability of various standards for private and public finance can help reduce transaction cost, ensure positive impact, reduce greenwashing, and build trust for green finance by:
    - Developing a "traffic light classification system" that includes a red finance taxonomy to complete existing green finance taxonomies. This would be applied for public and private finance and includes definitions of counterproductive and hard-to-abate economic activities across sectors that need to be phased out as quickly as possible;
    - Developing legal standards on environmental thresholds and performance indicators (i.e., technical screening criteria) that are enforced to minimize environmental risks;
    - Developing standards for measuring, verifying and reporting (MRV) data on environmental performance of investment and spending for better comparison to provide better comparability and reduce green-washing;
    - Utilizing green technologies and making environmental data publicly and easily available to improve transparency and trust in green finance and to facilitate informed climate finance decision making;
    - Improving the foundation for global markets and relevant asset classes to accelerate carbon-negative and nature/climate-positive investments, for example through the accelerated establishment of global carbon offset markets, ecosystem solutions, and common understanding of the fair application of carbon border adjustment mechanisms. This can include the use of proceeds from such mechanisms to support the transition in least developed countries.

- Private sector can be mobilized through new and existing climate finance mechanisms by:
    - Allocation of public finance to support sustainable and green development goals while avoiding significant harm to any SDG, e.g., fiscal spending, subsidies, state-owned enterprises (SOEs), public funds, and state-owned financial institutions. This will also provide investment incentives for private sector;
    - Supporting SOEs and sovereign issuers to scale up green financial instruments (e.g., green bonds, green sukuk), that in turn supports local green capital markets, particularly in developing countries;
    - Implementing ambitious, holistic and tailored green policy targets and supporting regulation (e.g., climate laws, phase-out of coal, deployment of renewables, sector transition plans, and climate adaptation) to provide clear and reliable policy directions and reduce risks of unclear targets for financial sector engagement;
    - Crowding in private capital for higher risk green projects through accelerated utilization of global infrastructure development facilities (e.g., GIF, MCDF) and other applicable climate finance instruments (e.g., green public funds, blended finance, guarantee facilities, public-private partnerships/PPP) that support de-risking of finance;
    - Supporting scientific based analysis and advocacy to enable facilities and regulatory and financial measures for accelerated phase-out of unsustainable assets and rapid scaling of pilots;
- Development and social transition aspects can be better integrated in climate finance by:
    - Ensuring a globally just transition through responsibilities of different economies that particularly supports children and vulnerable groups through mitigation and adaptation financing and capacity building;
    - Enhancing analysis of environment assets and evidence-based approaches to reduce COVID-19 related debt impacts particularly in developing countries including through smart and green sovereign debt collaboration (e.g., debt-for-SDG, debt-for-nature, debt-for-climate, sustainability-linked debt swaps).
    - Providing further climate finance support (e.g., USD100 billion commitment) and technical capacity for developing countries' green transition and capital mobilization (e.g., green capital market development, green facilities) for both mitigation and adaptation measures.

The report first gives an introduction on the transition journey ahead for climate finance in G20 members. It then provides a background on the current stage of climate finance, current ambitions of G20 members for smart policy-finance interaction. The recommendations build on the analysis and provide practices on how to improve policy-finance action to shift finance from polluting to green, to mobilize both public and private finance, and to improve climate finance in developing countries.

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# List of Abbreviations

| Abbreviation | Name |
|---|---|
| ACT | Accelerating Coal Transition |
| ADB | Asian Development Bank |
| ASEAN | Association of Southeast Asian Nations |
| BRIGC | Belt and Road Initiative International Green Development Coalition |
| CBAM | Carbon Border Adjustment Mechanism |
| CBD | Convention on Biological Diversity |
| CBDC | Central Bank Digital Currencies |
| CBI | Climate Bonds Initiative |
| CCUS | Carbon Capture, Utilisation and Storage |
| CDP | Carbon Disclosure Project |
| CfD | Contracts for Difference |
| CGT | Common Ground Taxonomy |
| CIF | Climate Investment Funds |
| COP | Conference of the Parties |
| CSRD | Corporate Sustainability Reporting Directive |
| CSWG | Climate Sustainability Working Group |
| DAC | Development Assistance Committee |
| DFID | Department for International Development |
| DFIs | Development Finance Institutions |
| DNS | Debt-for-Nature Swaps |
| DSSI | Debt Service Suspension Initiative |
| DWG | Development Working Group |
| ESG | Environmental, Social, and Governance |
| ESI | Energy Savings Insurance |
| ETM | Energy Transition Mechanism |
| ETS | Emission Trading System |
| EU | European Union |
| FAs | Financial Advisors |
| FAST | Finance to Accelerate the Sustainable Transition |
| FF | Foundation Framework |

| | |
|---|---|
| FMPs | Financial Market Participants |
| FSA | Financial Services Agency |
| G20 | Group of Twenty |
| GCCF | Governance of Climate Change Finance |
| GCF | Green Climate Fund |
| GEF | Global Environmental Facility |
| GFANZ | Glasgow Financial Alliance for Net-Zero |
| GFIT | Green Finance Industry Taskforce |
| GHG | Green House Gas |
| GIF | Global Infrastructure Facility |
| GIIN | Global Impact Investing Network |
| GRI | Global Reporting Initiative |
| HKMA | Hong Kong Monetary Authority |
| IBPES | Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services |
| ICMA | International Capital Market Association |
| IDB | Inter-American Development Bank |
| IDFC | International Development Finance Club |
| IFC | International Finance Corporation |
| IMF | International Monetary Fund |
| INFFs | Integrated National Finance Frameworks |
| IPCC | Intergovernmental Panel on Climate Change |
| ISSB | International Sustainability Standards Board |
| ITMOs | Internationally Transferable Mitigation Outcomes |
| JSE | Johannesburg Stock Exchange |
| LAC | Latin America and the Caribbean |
| LLPs | Limited Liability Partnerships |
| MAS | Monetary Authority of Singapore |
| MCDF | Multilateral Cooperation Center for Development Finance |
| MDBs | Multilateral Development Banks |
| MFF | Multiannual Financial Framework |
| MRV | Measuring, Validating and Reporting |
| NDCs | Nationally determined contributions |
| NFRD | Non-Financial Reporting Directive |
| NGEU | Next-Generation-EU |

| | |
|---|---|
| NGFS | Network for Greening the Financial System |
| ODA | Overseas Development Assistance |
| OECD | Organization for Economic Co-operation and Development |
| OJK | Financial Services Authority |
| PPP | Public-Private Partnerships |
| PRB | Principles for Responsible Banking |
| PRI | Principles of Responsible Investment |
| PSI | Principles for Sustainable Insurance |
| SASB | Sustainability Accounting Standards Board |
| SBFN | Sustainable Banking and Finance Network |
| SBN | Sustainable Banking Network |
| SDG | Sustainable Development Goals |
| SDRs | Special Drawing Rights |
| SEC | Securities and Exchange Commission |
| SFDR | Sustainable Finance Disclosure Regulation |
| SFWG | Sustainable Finance Working Group |
| SGX | Singapore Exchange |
| SI | Sustainable Infrastructure |
| SMEs | Small and Medium Enterprises |
| SOEs | State-owned Enterprises |
| TCFD | Task Force on Climate-Related Financial Disclosures |
| TNFD | Taskforce on Nature-related Financial Disclosures |
| UK | United Kingdom |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNEP FI | United Nations Environment Programme Finance Initiative |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNICEF | United Nations Children's Fund |
| US | United States |
| VCM | Voluntary carbon markets |

# 1. Introduction

Major crises, from COVID-19 to conflicts and fragilities, have set back the achievement of sustainable development goals, and even worse, risk undermining sustainable development trajectories: policy makers need to tackle the urgent crises and provide economic and social resilience. This must not come at the expense of long-term climate and biodiversity crises. According to Save the Children [2] a child born in 2020 will be exposed to twice as many wildfires, 2.8 times as many crop failures, 2.6 times as many drought events, 2.8 times as many river floods, and 6.8 times more heatwaves over their lifetime than a person born in 1960. In addition, limiting global warming to 1.5°C above pre-industrial levels reduces the risk of additional lifetime exposure to heatwaves by 45 percent, drought by 39 percent, river floods by 38 percent, crop failures by 28 percent, and wildfires by 10 percent for children born in 2020.

To put the world on track with the objectives of the Paris Agreement and the 2030 Agenda, G20 members representing over 85% of the world's GDP, around two thirds of its population and responsible for about 75% of greenhouse gas emissions [1], have a key role to play. They can address these challenges holistically and provide a sustainable direction for leaders, regulators, business executives, investors, non-governmental organizations and all societies. It is critical that governments accelerate their commitments to the Paris Agreement's next five-year cycle to limit global warming. They also can provide inclusive climate financing as well as social protection and support for vulnerable groups and their communities such as child and/or gender responsive financing, so that they can adapt to and recover from climate shocks more effectively.

More G20 members are working on developing and implementing core climate policies and much more needs to be done to reduce greenhouse gas (GHG) emissions (see Figure 1). By scaling up climate friendly finance and investments, reducing counterproductive subsidies, creating barriers for non-aligned investments through smart key policy actions, G20 members can accelerate technology solutions and industrial development programs of green energy, food systems, sustainable infrastructure, and trade.

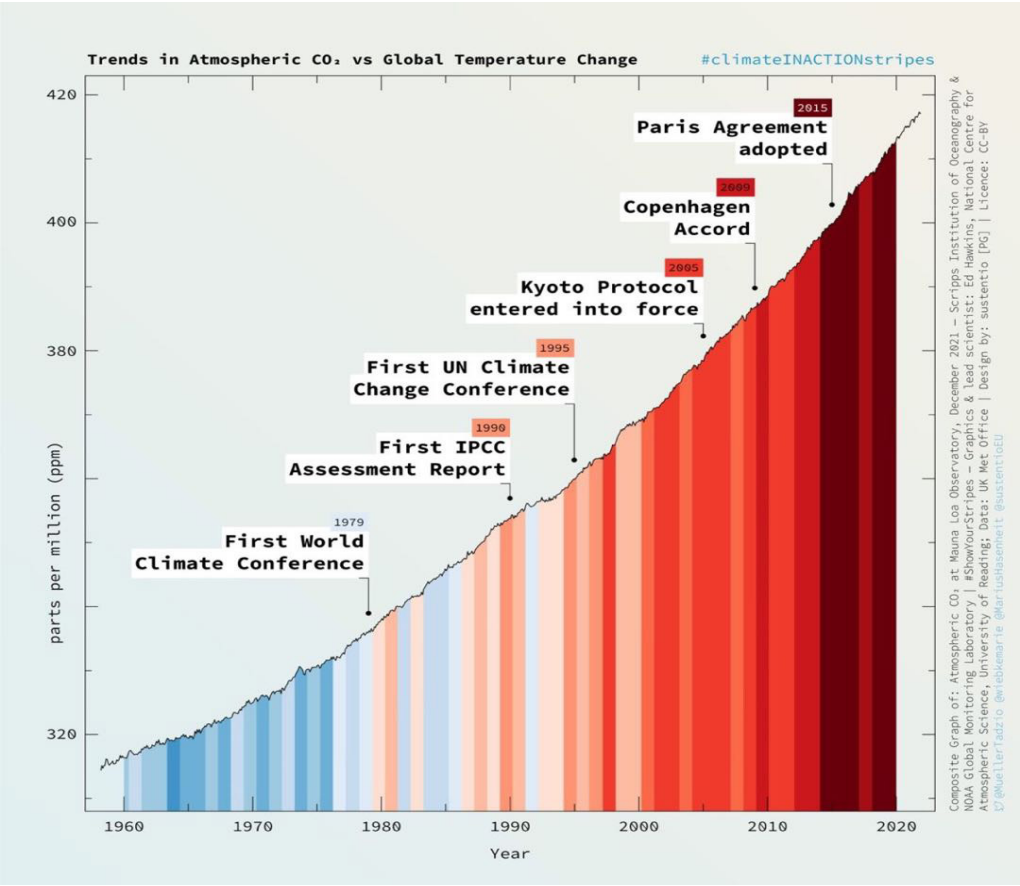


*Figure 1:Trends in Atmospheric $CO_2$ concentration and political agreements (Source: Sustenio[3])*

Investments in low-carbon technologies, ecosystem solutions, and sustainable and resilient infrastructure can spur green growth and economic recovery, address inequalities, and accelerate the transformation towards climate-resilient economies. In contrast, a continuation of current policy with public and private financial flows supporting non-aligned economic activities, is **akin to pouring oil onto the fires of climate change.**

In the Article 2.1c, Parties commit to "making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development." Now is the time to deliver on this commitment by converging post-COVID economic recovery programs with the transition to a low carbon climate-resilient global economy. By aligning all components of innovative finance, all kinds of funding opportunities can be seized – bilateral, multilateral climate funds, multilateral development banks (MDBs), other development finance institutions (DFIs), as well as domestic finance. By fully aligning public finance with sustainable development goals, much larger volumes of private investment can be mobilized.

# 2. Climate Finance Landscape Background

Addressing climate change and building a sustainable future for now and the world's future generations requires smart, tailored, and urgent policy action to drive an unprecedented global transformation of infrastructure, ecosystem resilience, food system and industrial development. The basis for this transformation is a massive shift of investments in technologies for low-carbon energy development, environmental and ecology protection, sustainable production and consumption, risk-informed and resilient infrastructure development.

## 2.1 Climate finance flows and gaps

Global climate finance [4] flows of US$632 billion were recorded in 2019-2020 (which doubled from US$365 billion in 2013-2014) – with equal contributions from the public and private sectors (see Figure 2).

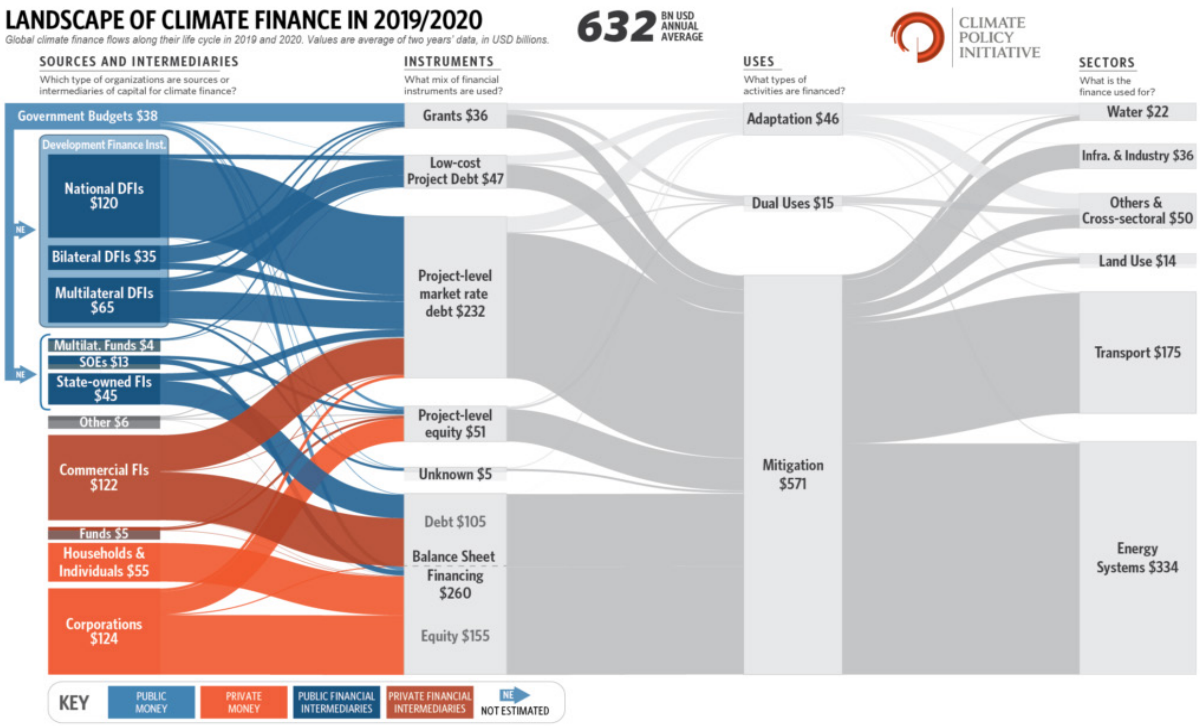


*Figure 2: Landscape of Climate Finance in 2019-2020 (Source: Climate Policy Initiative [4], 2021)*

Almost half of global climate finance in 2019-2020 was spent in East Asia & Pacific (US$292 billion), followed by Western Europe (US$105 billion) and US & Canada (US$83 billion). Latin America, South Asia, Middle East and African countries together accounted for about US$100 billion in climate finance (see Figure 3).

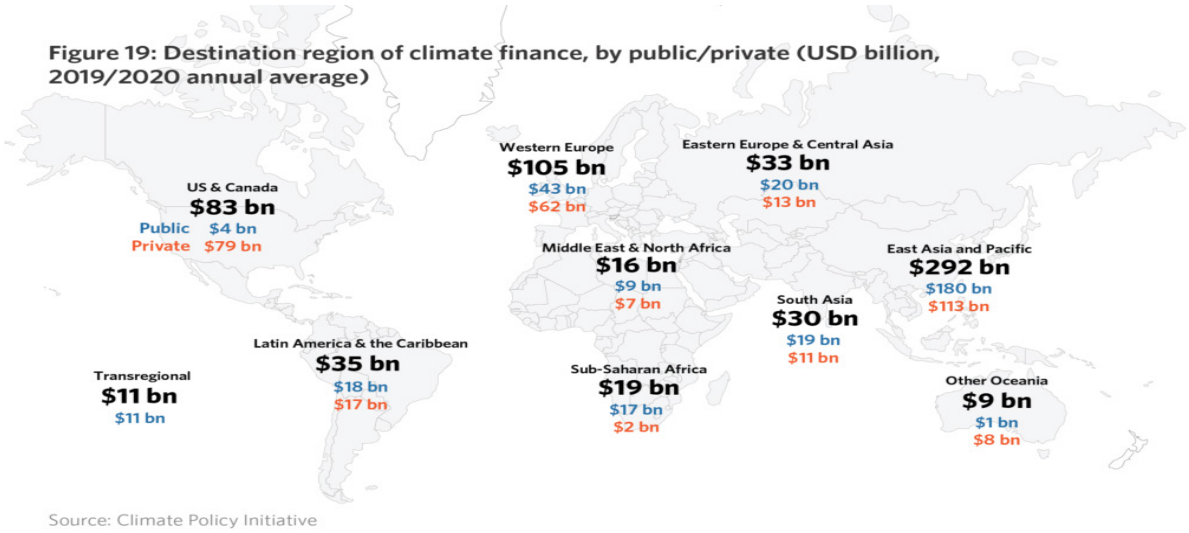


*Figure 3: Destination region of climate finance, by public/private (US$ billion, 2019/2020 annual average) (Source: Climate Policy Initiative)*

For climate protection alone, Climate Policy Initiative (2021)[4] estimates a global climate finance gap of US$3.6 to $4.1 trillion annually. McKinsey (2022)[5] estimates that investment needs to increase by US$3.5 trillion yearly to US$9.2 trillion to achieve net zero transition goals.

**Finance for adaptation falls short.** The Paris Agreement lays out a goal to balance finance between adaptation and mitigation. International community has called for 50% of the total share of climate finance to be spent on adaptation projects that help people adapt to climate change, especially for developing nations. Adaptation currently only receives 21% of all international climate finance – only $16.8 billion in 2018, compared to an estimated need of $70 billion annually and upwards of $140-300 billion dollars by 2030 and $280-500 billion by 2050 (see Figure 4).

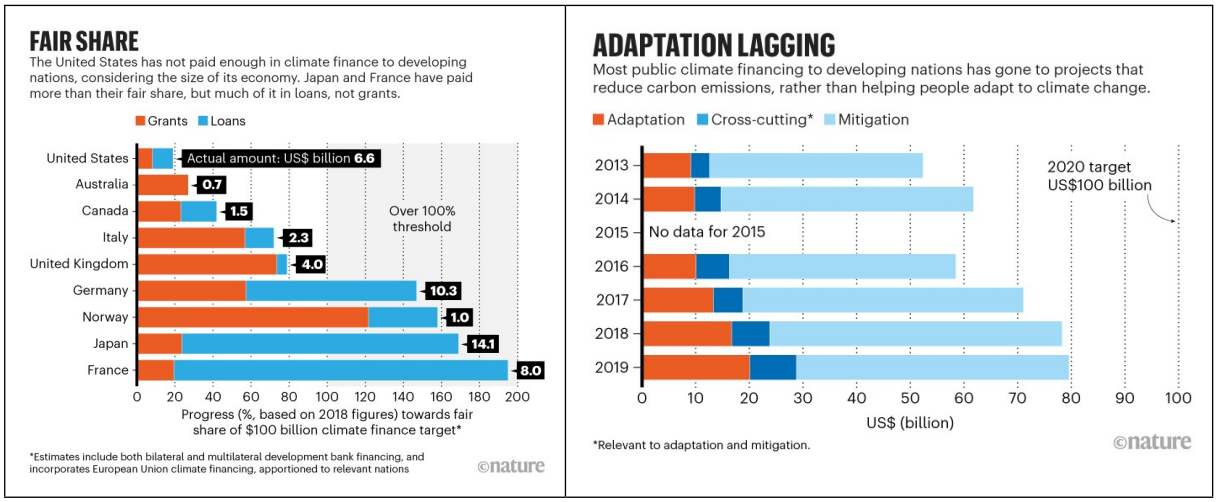


*Figure 4: Climate finance source to developing nations (Source: Timperley, 2021 [8])*

Within the G20 members in their 2021 Leaders Statement, the UNFCC and IPBES, as well as during COP26 in Glasgow, global recognition of the need to integrate biodiversity and climate considerations has been accelerating. Both aspects should ideally be tackled together to generate co-benefits (e.g., through ecosystem solutions, nature-climate solutions), utilize green financing more efficiently, and avoid further harm to either through insufficient integration. Taking this integration into consideration, biodiversity finance can promote climate protection, yet global biodiversity finance[6] flows in 2019 amounted to only US$143 billion compared to US$536 billion financing need for ecosystem solutions[7], according to UNEP (2021). Similarly, the 2020 Financing Nature report[6] estimates a biodiversity financing gap of US$598 to US$824 billion per year.

## 2.2 Counterproductive public and private finance

**The lack of finance stands for climate action and environmental protection is exacerbated by continued public and private finance flowing into unsustainable sectors.**

**Public finance contributes to climate change** through state-owned enterprises, state-owned financial institutions, and public spending. While the G20 has committed to phasing out inefficient and counterproductive fossil fuel subsidies in 2009[9], global governments spent US$5.9 trillion (or 6.8% of GDP) on fossil fuel subsidies in 2020 according to a 2022 IMF study, and fossil fuel subsidies were expected to rise, according to a 2021 OECD study[10]. Similarly, with the agricultural sector being the second most important contributor to greenhouse gas emissions (when including land use change) it is also important to note that among the Aichi Target 3 of phasing out incentives including subsidies harming biodiversity by 2020 was only met by 25 out of 196 nations while about 90% of subsidies[11] given to farmers tend to damage nature and fuel the climate crisis according to a 2021 UN report.

In addition, **SOEs are among the world's largest corporate emitters of greenhouse gases,** often due to a focus on traditional energy and transport assets: according to a 2022 joint Oxford and Columbia University study [12], SOEs in the power, industry and transport sectors alone emit at least an aggregate of 6.2 gigatons of CO2e annually (Scope 1), making them cumulatively larger emitters than any other single country except China. Similarly, CDP estimates [13] that the largest global SOEs are responsible for 42% of global greenhouse gas emissions.

On the private side, the **world's 60 biggest banks have provided US$3.8 trillion** [14] **of financing for fossil fuel companies** between 2015 and 2020 with US$751 billion alone in 2020. By October 2021, Bloomberg [15] reported US$459 billion fossil finance organized by the largest banks in the first 9 months of 2021.

At the same time, improving **green capital markets based on regulatory guidance, supervision strategies, and voluntary banking sector approaches** have significantly expanded green finance instrument issuance[16] (e.g., loans, bonds) in many developed and some emerging G20 members[17]. Yet, green finance only constitutes less than 10% of the market, even in the EU [18], while many developing economies' (green) capital markets [19] are in need for further regulatory support, capacity and development to attract more issuances and investors.

## 2.3 The cost and risk of failing in climate action

### 2.3.1 Social and economic risk of climate change

**A low level of addressing climate change risks up to 25% of global GDP by 2100, according to the NGFS (2020)** [20]. Particularly, less developed countries would experience a higher relative economic loss relevant for people's livelihoods, according to the IMF (2021) [21] and the number of affected nations, according to S&P Global (2022) [22]. This risks exacerbating global inequalities and driving 68 to 135 million people into poverty by 2030, according to the World Bank (2020) [23]. The climate crisis also affects children's rights, who risk being locked into poverty without strong adaptation policy, particularly in countries that are risk of natural disasters, according to UNICEF (2021) [24] (see Figure 5). Extreme climate crises increase social inequality because women and girls are more likely to live in poverty (70% of total global poor population) [25], depend more on access to natural resources and bear a disproportionate responsibility for securing food, and fuel yet have less access to essential services, and face systematic violence that escalates during periods of instability.

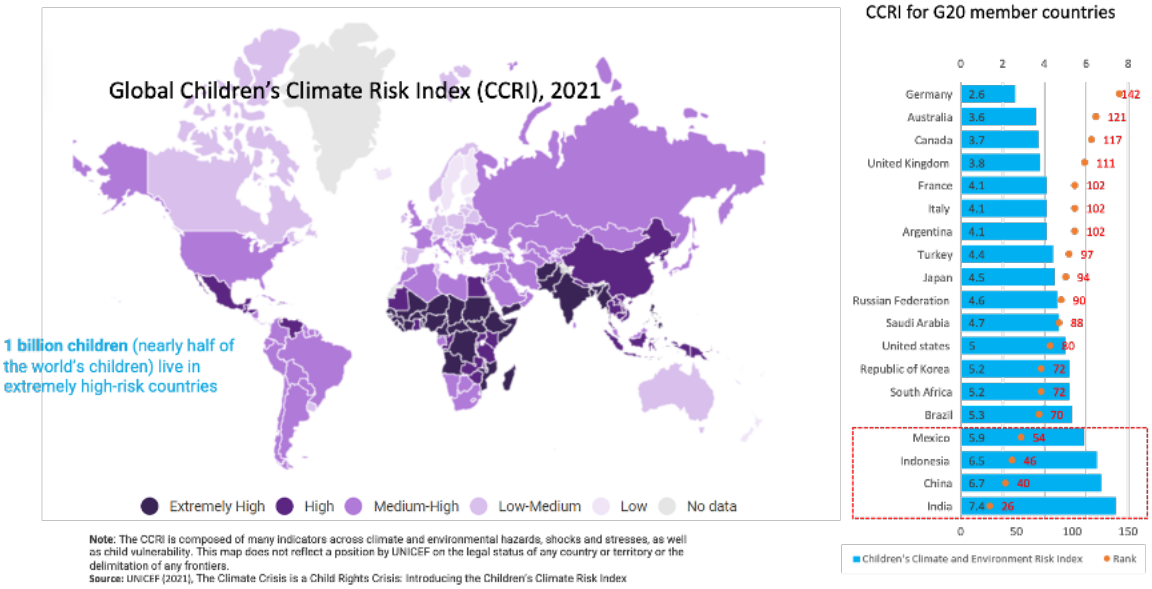


*Figure 5: Impacts of climate change on children - Global Children's Climate Risk Index (UNICEF [24])*

**Urgent action is advised with costs rising exponentially the later action is taken:** The cost of climate change mitigation and adaptation tends to rise exponentially the later climate change is mitigated: the UN estimates annual adaptation costs [26] in developing countries at US$70 billion should decisive actions be taken in 2021; this figure is expected to reach US$140-300 billion for decisive actions delayed to 2030 and US$280-500 billion in 2050.

**Contrary, by investing in climate change mitigation and adaptation net-gains of 15 million jobs could be achieved by 2050**, according to a 2022 McKinsey [5] study. It would require re-training and possibly re-location of workforce to development, production, and operation site of new industries.

### 2.3.2 Climate-biodiversity nexus

**A particular opportunity and necessity to address the climate crisis is to tackle it together with the biodiversity crisis,** according to a 2021 statement by IBPES and IPCC [27]. Climate change and biodiversity loss are mutually linked, with climate change leading to biodiversity loss and biodiversity loss leading to climate change. Increasing net-zero and nature-positive investments to address the biodiversity and climate challenges has been reflected in the Global Biodiversity Framework's Target 19 [28] of the UN Biodiversity Conference (COP15) [29], the Glasgow Climate Pact [30] of the UN Climate Change Conference (COP26).

Some climate-positive actions for mitigation and adaptation might exacerbate biodiversity loss (e.g., grey infrastructure, some technological solutions, and single-crop carbon offsets), which further exacerbates social and economic risks (e.g., loss of ecosystem services such as water, pollination, soil quality).

Attention is necessary, as some **supposed biodiversity investments harm both biodiversity and climate** (e.g., planting trees in ecosystems that have not historically been forests, or reforestation with monocultures). Accordingly, investment in carbon- and species-rich ecosystems on land and in the ocean (e.g., forests, wetlands, peatlands, grasslands, mangroves), increase of sustainable agriculture and forestry practices (e.g., diversification of plants), and protection of existing ecosystems are areas that best combine climate-, nature-, and social benefits.

## 2.4 Responsibilities for development and social considerations

Achieving the sustainable transition requires action from all countries. To reduce carbon emissions, particularly developed countries and countries with growing absolute emissions need to accelerate finance for the low-carbon and green transformation.

Least developed countries and developing countries need to utilize received financial support in achieving the physical and social transformation to adapt to climate change, while protecting and restoring natural resources and ecosystem services. The pledge of providing US$100 billion per year from developed to developing countries in climate finance needs to be upheld and efficiently used to accelerate the reduction of greenhouse gas emissions based on the NDCs.

**Last but not least, a solution to financing the global climate crisis cannot work without addressing the debt crisis** for many low-income countries, where sovereign debt levels reached US$860 billion in 2020 [31].

# 3. Experiences in G20 members to catalyze and promote climate finance

Regulators, law makers, financial associations, and private organizations in G20 members and beyond have proposed, developed, and applied policies, systems, and instrument to accelerate finance for the green transition, that can serve as a role model for accelerating climate and green finance application.

These ongoing practices are highly context specific and often cannot be easily compared or standardized. The ambition is therefore to ensure relevant impact, while it is important to harmonize where possible to ensure comparability, cross-border facilitation, and capital flows.

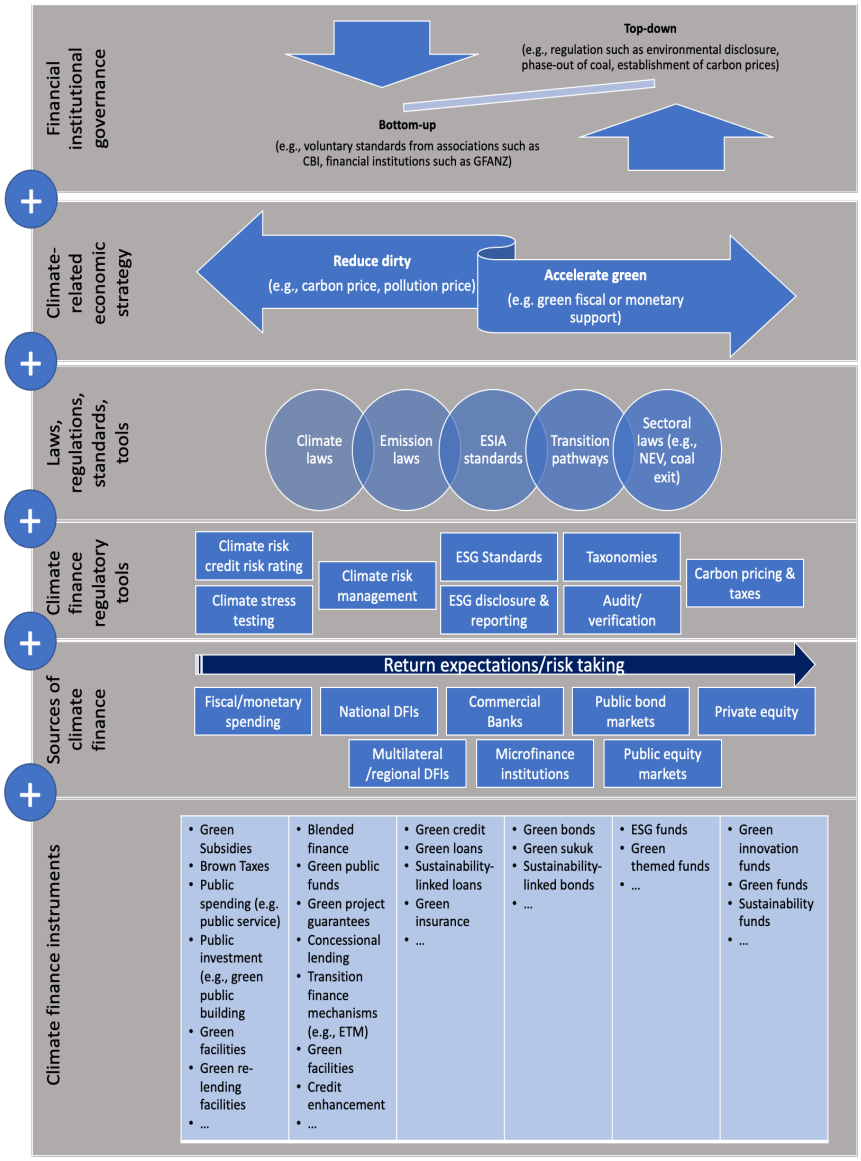


*Figure 6: Green financial frameworks (Source: Author)*

Key elements of a structured climate finance system are supposed to include (see Figure 6):

- Climate finance governance – top-down (e.g., China); bottom-up systems (e.g., through voluntary standards), and mixed-systems (e.g., EU);
- Dual goal of emission reduction and scaling of green opportunities;
- Climate related laws and regulations impacting climate finance (e.g., climate laws);
- Climate-finance related regulatory tools, e.g.,
  - central bank and financial regulatory measures;
  - common definitions of real economy activities that need to be financed (e.g., through green finance and sustainable finance taxonomies);
  - climate risk evaluation and management (e.g., TCFD, TNFD), and disclosure standards to provide transparency in reporting and avoiding greenwashing (e.g., the EU's Non-Financial Reporting Directive on corporate sustainability disclosure);
  - carbon pricing.
- Climate finance sources (e.g., public, private, development finance);
- Climate finance instruments (e.g., green bond, green credit, green sukuk, green fund);
- Integration of green financial system.

## 3.1 Climate finance governance

The policy environment of climate finance of the G20 members are organized depending on different institutional settings and development phases, which determine the power of the various players and the levers to influence development paths of climate finance. Broadly, they can be distinguished between top-down systems driven by governments (e.g., China), cooperative systems (e.g., EU) or bottom-up systems driven by market-players (e.g., United States).

A top-down governance system of green finance in China is rooted in its underlying political economy model labelled as 'Grand Steerage' of the economy [32]. For green finance, the state takes an active role in providing guidance, regulations, and financial backing through various line ministries. This allows for rapid growth of the green financial system with support from state-owned enterprises and state-owned financial institutions: after the establishment of the Green Financial System in 2015, China became one of the largest green bond markets with SOEs accounting for 42% of the green bond issuances volume. While China's green financial volume is among the largest in the world, its different regulators are responsible for various aspects of the green financial system with gradual integration of the different instruments and rules.

The EU's multi-layered green financial system (see Figure 7) is a hybrid model. The system is based on multilateral framework (e.g., Paris Agreement), EU frameworks (e.g., EU Taxonomy, Fit-for-55), EU regulations (e.g., Sustainable Finance Disclosure Regulation, EU Taxonomy), national ambitions of EU member states and financial markets, as well as voluntary approaches of financial institutions and other stakeholders (e.g., Glasgow Financial Alliance for Net-Zero, GFANZ) or independent commitments by financial institutions.

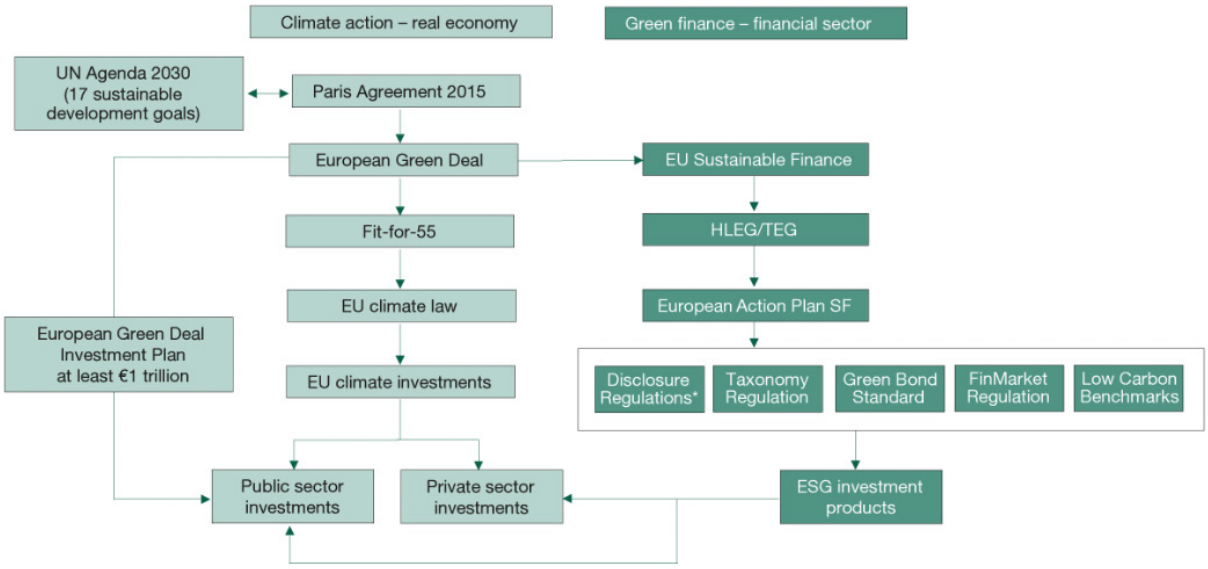


*Figure 7: The EU's Sustainable Finance Strategy (Source: Intereconomics [33])*

The bottom-up system, meanwhile, is driven by industry associations, individual organizations, and initiatives. These aim to drive ambitions, share capacity and knowledge, as well as to provide transparency and accountability among its members and possibly to the public. These initiatives are often supported by multilateral or international organizations, including private organizations (see Appendix 4 for selected initiatives). For example, At COP26 in 2021, the Glasgow Financial Alliance for Net Zero (GFANZ) established a global network for different types of financial institutions to commit and share climate ambitions publicly, and to provide knowledge to its members.

## 3.2 Climate laws

The climate finance architectures and/or approaches in G20 members are to different extend geared toward the dual ambition of reducing harmful activities (e.g., through carbon pricing and climate laws) and accelerating green activities (e.g., through growth of green finance and relevant fiscal/monetary support measures). A basis for all green financial systems is the overwriting climate ambitions of the country that determines investor's appetites and financial and technological innovation. The G20 members have mostly increased their climate ambition, but their climate targets are not sufficient to meet the Paris goals with multiple G20 members having non-binding and non-climate neutral targets beyond 2050 (see Figure 8).

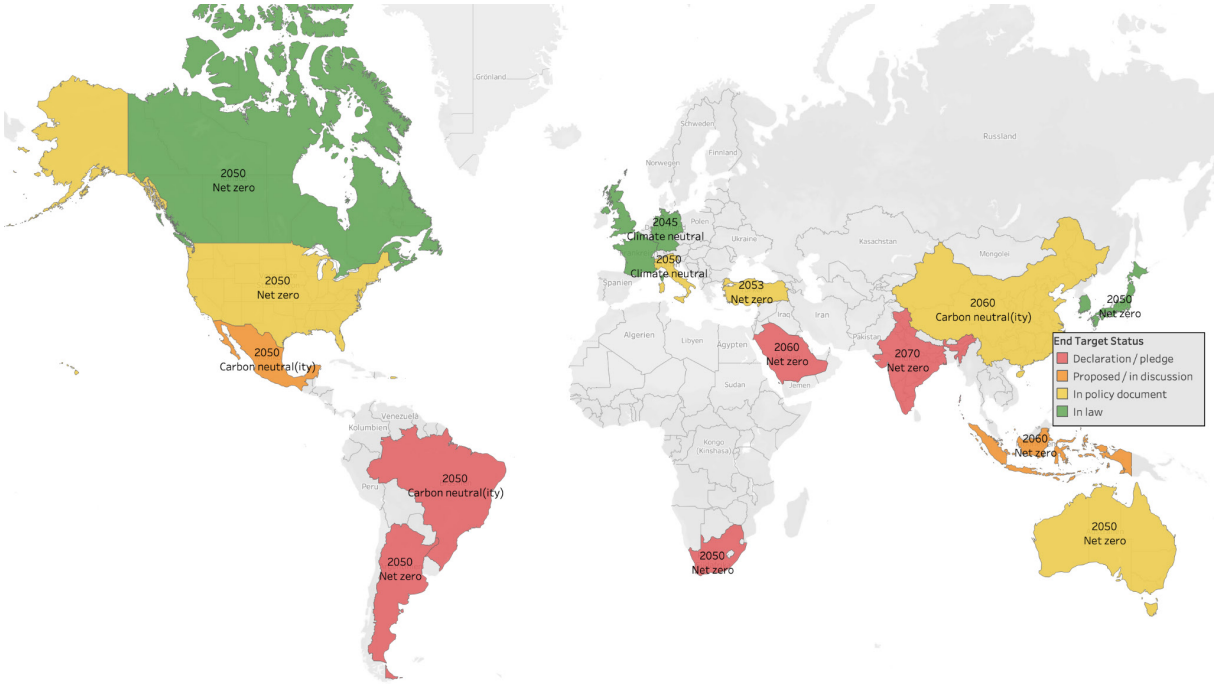


*Figure 8: Climate targets in G20 (EU has 2050 climate-neutral target in law but was not included in the graph) (Data: Net Zero Tracker, Graphic: author)*

A number of G20 members have also issued specific laws to accelerate either the phase-out of specific polluting sectors (e.g., Germany's coal exit law), or to accelerate the use of greener technologies (e.g., EU's energy plan, China's national renewable energy targets).

## 3.3 Climate-finance regulatory tools

### 3.3.1 Definitions of green finance through taxonomies

Many G20 members and other global economies have developed green finance taxonomies as part of their green finance systems as a standard to define green economic activities (see Figure 7 and **Appendix 1**). Taxonomies and standards provide shared definitions for investors and policy makers, and reduce transaction cost [34] for investors aiming to invest in endorsed assets. Particularly market-driven standards allow for cross-border finance. Taxonomies have been issued by national and supra-national (e.g., EU) governments, as well as private institutions, such as the Climate Bonds Initiative (CBI), ASEAN Green Bond Standard, ICMA Green Bond Principles.


*Figure 7: Global green Taxonomies (Source: Climate Bonds Initiative, 2022[35])*

To further allow for cross-border finance, efforts to harmonize green taxonomies are ongoing. Progress has been made through the IPFS under the leadership of the EU and China in 2022 through the Common Ground Taxonomy [36] and as well as through the G20 SFWG. Nevertheless, harmonization continues to be challenging [37] due to different development status of countries, different approaches to green finance in terms of the financial system and definitions of green activities.

Apart from providing "green standards", a new, and promising, approach to shift finance is to define **counterproductive economic activities.** Amongst others, Indonesia [38], Singapore and China for its overseas investments [39], have issued such "red" taxonomies as part of "traffic light systems". In these taxonomies, fossil fuel finance, for example, would be labelled red as a signal for investors and policy makers to restrict financing. With challenges on agreeing particularly on transition taxonomies, agreeing on economic activities that need rapid phase-out can be a viable pathway.

An important aspect of applying green taxonomies are **external reviews.** Currently, private sector solutions dominate the green external review market offering different approaches, such as second-party opinions, third-party certifications, ratings for environmental, social and governance performance (ESG rating), assurance, and audit, etc.

As concerns have arisen regarding the reliability and comparability of green labels, countries have started to put in place, or have upgraded, regulatory frameworks to guide private external review activities (EU, China). China's Green Bond Assessment and Verification Guidelines [40] provide an example how a central bank can support qualification of external institutions' assessments and certifications of green bonds.

### 3.3.2 Selected risk management, reporting and disclosure standards

Various G20 members and others have introduced standards to improve non-financial disclosure on the national, market and sector level (see **Appendix 3 for an overview**) - also referred to as "ESG" disclosure. These standards aim to provide more transparency on environmental impacts and environmental risk exposure to financial and commercial actors and thus provide both incentives for improving environmental performance and reducing environmental risks, as well as transparency for informed financial decision-making.

In G20 members, these standards are driven by various entities, such as governments (e.g., EU Sustainable Finance Disclosure Regulation), markets (e.g., Shenzhen Stock exchange), member organizations with support from multilateral institutions (e.g., Global Reporting Initiative), as well as by NGOs in collaboration with market players and governments (e.g., TNFD, CDP). These standards provide frameworks for different aspects of disclosure (e.g., climate, biodiversity risks and impacts), and address different types of market players (e.g., financial institutions, broader economy).

As various reporting standards are often in competition or co-opetition and therefore not standardized, an increasingly complex network of reporting standards has become available. This allows companies and financial institutions to choose ambitious or less ambitious standards, and thus increases the risk of greenwashing.

National risk management and disclosure frameworks are therefore being developed. For example, the Japanese Financial Services Agency (FSA) in April 2022, released draft Supervisory Guidance on Climate-related Risk Management and Client Engagement. This guidance documents viewpoints of supervisory dialogues regarding financial institutions' climate-related risk management and engagement with their clients to support the clients' responses to climate-related opportunities and risks. Similarly, the EU provided various frameworks for non-financial disclosure (see Table 1Table 1).

*Table 1: Non-financial disclosure in the EU (Source: European Union [41])*

| Scope | Large corporations and all listed companies | Financial market participants offering investment products, and financial advisers | Financial market participants; all companies subject to Corporate Sustainability Reporting Initiative |
|---|---|---|---|
| Instrument | Corporate Sustainability Reporting Directive (CSRD) proposal | Sustainable Finance Disclosure Regulation (SFDR) | Taxonomy Regulation |
| Disclosure | Report based on formal reporting standards and subject to external audit | Entity and product level disclosure on sustainability risks and principal adverse impacts | Turnover, capital, and operating expenditures in the reporting year from products or activities associated with Taxonomy |
| Status | Under negotiation, expected to apply from 2023 | Applies from 10 March 2021 | Applies from January 2022 |

In May 2021, the Ministry of Economic Development of Russian Federation approved methodological recommendations for adoption climate change that consists of four documents, including recommendations for climate risk assessment. These recommendations are the basis for creating a national climate risk management system in Russia.

### 3.3.3 Ecosystem solutions

Ecosystem solutions play an important role for carbon sequestration which could result in carbon credits. China has also underscored the importance of carbon sequestration linked to nature-based solutions [48]. The February 2022 UNEA-5 [49] resolution marks the first time a multilateral body has adopted by consensus a universal definition of such ecosystem services. The recent State of Nature in the G20 report [50] of UNEP and others underscores the importance of making the financial case for ecosystem services. Greater engagement by private investors is needed to close financing gaps in this domain. Estimates by the 2021 State of Finance for Nature report [7] suggest US$133 billion is invested annually in ecosystem solutions. Of this total, 86 percent or US$115 billion is public financing related to conservation, regeneration of forests, peat lands, agriculture, water conservation, and natural pollution control systems. The report estimates that private sector ecosystem solution financing is much lower, at 14 percent of total annual financing – or US$18 billion per year – with investments dominated by biodiversity offsets, sustainable supply chains, impact investment and private philanthropy investments.

The report identifies five priorities to increase financing for ecosystem solutions:

- Increase Overseas Development Assistance (ODA);
- Reform agricultural subsidies;
- Mandate Multilateral Development Banks (MDBs) to increase ecosystem solutions financing;

- Link developing country debt relief with ecosystem solutions investments;
- Support results-based ecosystem solutions public financing linked to green bonds.

### 3.3.4 Carbon pricing

Pricing the environmental rights including carbon emission is an increasingly relevant tool to incentivize de-carbonization and nature-positive outcomes, and simultaneously to disincentivize emissions and natural exploitation. [For detailed analysis relevant to this topic, please also refer to CSWG Study 3.2]

**Emission trading systems (ETS)**

By 2021, 65 carbon pricing schemes were applied in 45 national jurisdictions and 34 subnational jurisdictions, covering about 21.5% of global GHG emissions. As can be seen in Figure 8, The EU emission trading system (EU ETS) (and similarly the UK ETS after separating from the EU ETS) is the most mature with relatively high prices of above EUR100 per ton of CO2e.

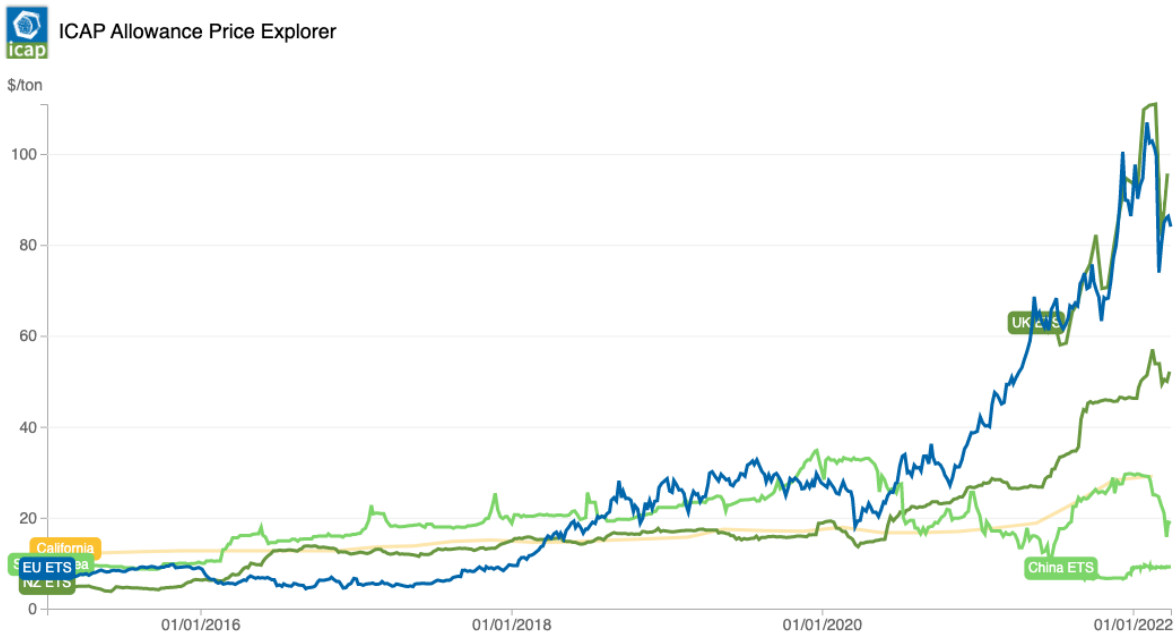


*Figure 8: Carbon prices (USD/ton) in EU, California, and China (Source: ICAP)*

Voluntary carbon markets (VCM) that allow companies (and individuals) to reach their pledges of carbon neutrality by buying carbon offsets also in lieu of regulated carbon markets. In 2021, VCM for airlines have grown by 900% and corporate carbon offsets by 170% [42]. McKinsey together with the International Institute of Finance estimates [43] that voluntary carbon markets could increase by a factor of 15 or more by 2030 and by a factor of 100 by 2050. Carbon credits could come from four categories: avoided nature loss (including

deforestation); nature-based sequestration, such as reforestation; avoidance or reduction of emissions such as methane from landfills; and technology-based removal of carbon dioxide from the atmosphere

**Paying for importing carbon**

Paying for "importing" carbon is another concept to price carbon emissions. In March 2022, the EU Council agreed on the Carbon Border Adjustment Mechanism (CBAM) [44]. Also other countries, notably the US in July 2021 [45] and the UK in September 2021 [46] introduced plans or evaluations of carbon border adjustment mechanisms. The ambition is to reduce carbon leakage and price consumption-based rather than production-based carbon emissions. This has been a source of contention from some developing countries with high exports into developed countries over who should be accountable for emissions. At the same time, some developing countries have expressed fears of such mechanisms adding costs to exports [47] and the idea that revenues from pricing carbon could flow back into developing economies in supporting a green transition.

**International carbon markets**

Carbon markets and carbon offsets have been further strengthened by the agreement on Article 6 of the Paris Agreement at COP26 in Glasgow in 2021. Through the introduction of internationally transferable mitigation outcomes (ITMOs) and Article 6, paragraph 4, emission reductions (A6.4ER) with governance to avoid double-counting of carbon reduction credits and providing more flexibility than previous CDTM. However, implementation of Article 6 and international carbon markets rests on complex governance structures, pricing issues and technical capacity challenges [42], not only in developing economies. Furthermore, ensuring additionality of ITMOs continues to be a challenge with risks in under-ambitious NDC (i.e., overperforming on NDCs and generating ITMOs) and perpetuity (e.g., afforestation projects).

## 3.4 Climate financing sources

G20 members have access or have developed various public and private sources of climate finance. These include, for example:

- public fiscal spending (e.g., through subsidies in renewable energy);
- green public funds through development banks or national green funds (e.g., China's National Green Development Fund 51, or UK's Green Investment Bank);
- development finance institutions, such as bilateral or multilateral development banks including their facilities (e.g., World Bank's Climate Support Facility or the Green Climate Fund);
- private financial institutions, including
    - microfinance institutions particularly in developing economies (e.g., UNEP's microfinance for ecosystem-based adaptation MEBA [26] supported by the German government);

- commercial financial institutions issuing green loans and insurances (and micro-insurances as supported e.g., by the ADB) for environmental insurances.
- public capital markets:
  - green bond markets;
  - equity markets with a focus on environmental, social and governance performance (such as the EU green capital markets union [18]).
- private equity, including impact funds.

The appropriate source of climate and green finance is contingent on factors, including availability of funds (e.g., capital markets tend to be more developed in developed countries, while microfinance is applied more widely in developing countries, bank credit is applied across the world in different degrees), risk and return requirements of investors (e.g., public finance can provide negative return financing, while private equity would expect high returns), and scalability of finance (e.g., very unique or small projects require specialized sources of finance, while scalable infrastructure finance is more standardized).

## 3.5 Climate finance instruments

Climate and green finance instruments aim to provide asset classes or tools to finance aligned projects. G20 members have developed and applied numerous instruments tailored to accelerate public and private financing for sustainable activities for different asset classes (see Appendix 2 for a more comprehensive list of climate and green finance instruments). These address individual, public, private and public-private finance (see Table 2).

*Table 2: Examples of climate and green finance instruments*

| Individual/micro enterprises | Commercial debt | Commercial equity | Public | Public-private/ development |
|---|---|---|---|---|
| • Green credit support<br>• Green microfinance<br>• Green mortgage | • Green credit/green loans<br>• Green bonds<br>• Sustainability-linked loans<br>• Transition bonds | • ESG funds<br>• Impact finance | • Green sovereign bonds (e.g., Germany, China, Indonesia)<br>• Sustainability-linked sovereign debt (e.g., Indonesia)<br>• Debt-for-nature swaps (USA)<br>• Guarantees<br>• Subsidies | • National green funds<br>• Blended finance<br>• Guarantees<br>• Project development facilities<br>• Credit enhancement facilities |

Further instruments are tailored at specific environmental goals, for example through "payment for ecosystem services" to scale up financing for ecosystems, or national or subnational "carbon markets" to price carbon or more broadly climate emissions (e.g., in Germany, South Korea, parts of the US, subnational in Japan etc.).

A particular set of financial instruments and strategies that is gaining prominence are related to **early retirement of heavy polluting assets,** such as coal-fired power plants. Indonesia, as one country, is preparing Energy Transition Mechanism to retire coal power plant and transition it to new and renewable energy. Various private, public and development financial instruments [52] are being explored and have been applied (e.g., in Germany) to accelerate the retirement of such assets.

As part of this, **Just Transition Mechanisms** have been devised, e.g., South Africa's International Just Energy Transition Partnership [53] with the support of France, Germany, UK, US and EU.

Climate finance instruments are ideally matching specific risk-return profiles of projects, investor preferences and market conditions. Accordingly, the relevance of the application of specific climate finance instruments is context dependent (e.g., green bonds are more applicable in developed capital markets, while microfinance is more relevant to provide finance in informal markets). Particularly **in emerging markets, green capital markets are often in need for further development** [19] and specific financial market-based instruments are less applicable or need more support (e.g., through government-led green bond issuance, such as in Indonesia, China). Other instruments are more applicable, such as green micro-finance, bank lending and blended finance, as well as support through guarantees or other green facilities.

Also, sovereign lenders (e.g., government, state-owned enterprises, state-owned financial institutions) can utilize green capital markets (e.g., through the issuance of green sovereign bonds). Many G20 members have issued green sovereign bonds (or green sukuk) on the national and sub-national level, as well as through SOEs, including France, Germany, Mexico, China, Indonesia. If issued on local capital markets, these green sovereign bonds have strong potential to support local green capital market development [54].

The availability of the instruments is dependent on regulatory approvals and support (e.g., Japan is providing financial support for issuing green bonds, China's scaling of green bond and green credit markets is based on strong policy support and application through SOEs). The scalability of the instruments depends on available project pipelines and market conditions.

Many of these instruments have been utilized without "green" aspects for decades, and thus need to be tailored to integrate effective climate aspects. Some innovative instruments, particularly on the derivatives markets, such as green asset-backed securities, still require more market discovery for proper pricing.

## 3.6 Climate finance in developing countries

Providing finance for infrastructure and capacity development from developed G20 members to developing countries for climate mitigation and adaptation, ideally integrated with nature protection and ecosystem solutions in developing countries, has been an important pillar in the protection and restoration of the global nature and climate.

### 3.6.1 Development finance commitments

**Developed countries at COP26 have reaffirmed their commitment to provide USD 100 billion per year in climate finance in developing countries.** Global funds have also been supported, such as the Global Environmental Facility (GEF) having provided more than USD139 billion in finance for nature in developing countries, and similarly the Green Climate Fund (GCF) that had provided USD10 billion in finance for climate-related projects. Bilateral engagements from G20 members through development banks, many of which are organized through the International Development Finance Club (IDFC), also committed to improve climate-finance and SDG implementation, e.g., through its five voluntary principles. By September 2020, over 48 financial institutions, including 23 bilateral, regional, and national development banks, as well as 13 commercial financial institutions were part of the Initiative.

### 3.6.2 Local green capital market development

Green capital market development in developing countries has been supported by G20 members, and multilateral financial institutions to catalyze private and public finance for green development.

Support has been given for design and capacity building (e.g., IFC's Sustainable Banking and Finance Network) and through underwriting green bond issuances in developing countries (e.g., ADB's US$20 million investment in Georgia's railway green bond) [54].

Local green capital markets have also been developed by green bond issuances from state-owned or state-backed companies and financial institutions based on their lower risk profile and larger issuance size, e.g., in China and Indonesia.

### 3.6.3 Sovereign debt in developing countries

As COVID-19 continues to interrupt economic activities, induce higher public spending, and decrease tax revenues, **sovereign debt issues in certain countries have become more challenging.** Sovereign debt risks have further been exacerbated by recent disturbance of supply chain and geopolitical tensions. In 2020 it has noted that the debt burden [55] of low-income countries rose 12 per cent [31] to a record US$860 billion in 2020. The International Monetary Fund (IMF) sounded alarm bells in December 2021, warning that 60 per cent [56] of low-income countries are at high risk or already in debt distress, up from 30 per cent in 2015. Sovereign debt ratings [57] in 2021 and 2022 have fallen particularly in developing countries. The sovereign debt crisis has strained the availability of resources for conservation, while social considerations, such as the provision of jobs and job security, have led to stimulus efforts that potentially result in unsustainable economic growth (e.g., by focusing on grey infrastructure, brown energy).

In response to the sovereign debt issue, several initiatives have been launched since the pandemic:

- The G20 Debt Service Suspension Initiative (DSSI) provided US$10.3 billion in debt-service relief to 40 countries. DSSI was available to 73 low-income countries, and was not extended beyond December 2021.
- The IMF-World Bank "Common Framework," intended to coordinate debt restructuring among Paris Club and non-Paris club creditors, currently involves only three countries (Chad, Ethiopia, and Zambia).
- The IMF agreed to release US$650 billion in Special Drawing Rights [58] to help countries during the crisis. In November 2021 at the China-Africa FOCA summit, China pledged US$10 billion [59] (of its share of US$40 billion in new SDRs) to help African countries recover from the pandemic.
- On 18 April 2022, the IMF approved a new, Resilience and Sustainability Trust [60] to help countries manage structural risks linked to climate change and the ongoing pandemic: roughly three-quarters of countries are eligible to apply for support through the new fund, which has initial pledges of US$40 billion.

**While welcomed, recent initiatives are likely insufficient in the face of sharply worsening debt sustainability conditions.** Among the suggestions is to turn to more comprehensive lessons of the past, notably the Highly Indebted Poor Countries Initiative and HIPC+, or updating a new version of Brady Bonds [61]. The Tackling the Triple Crisis Proposal [62] **proposes using debt swaps to help debtor countries meet climate, nature, and other goals. Debt-for-nature swaps (DNS) have been discussed as a concept to ameliorate multiple of these problems at the same time:** it could reduce debt burdens, particularly in developing countries with high external public debt, and direct funds to conservation or restoration in these countries to create employment. DNS are a financial tool initially developed and applied in the 1980s to deal with this dual problem of nature loss and sovereign debt by exchanging sovereign debt for the conservation or restoration of nature. Accelerating environmental destruction and the accompanying need to mobilize billions to finance nature protection led to a resurgence of calls to apply DNS, including from large creditor regions, such as in September 2021 from the European Commission and the OECD. The US through the Development Finance Corporation (DFC) together with The Nature Conservancy has supported the government of Belize at the end of 2021 in a US$364 million financial transaction [63] that will enable the country to reduce its debt burden and generate an estimated US$180M for marine conservation. China, as the largest bilateral creditor in developing countries [64], is also evaluating the application of various forms of debt restructuring, including debt forgiveness on non-interest-bearing loans, and debt-for-sustainability swaps [65]. Similarly, Indonesia agreed with Germany and Global Fund to a US$50 million debt-for-health swap [66] in 2021.

**Without solving the debt crisis quickly and decisively, sustainable development regarding social, environmental and economic progress will likely regress in many developing countries,** particularly in light of accelerating inflation and exchange-rate volatility due to armed conflicts and supply chain issues.

# 4. The Way Forward

Taken the current climate and green finance gap, and seeing current climate finance ambitions of G20 members, lessons can be drawn, and challenges can be identified. These can be summarized as:

## 4.1 A transformative effort

As the combined effort of G20 members shows, transforming finance requires the comprehensive and rapid development and application of fiscal, monetary, regulatory, and voluntary instruments, tools, and systems. Through incentives and disincentives, these tools aim to reduce finance flows into counterproductive activities and accelerate sustainability-aligned finance by creating commonly accepted standards and reducing transaction costs through interoperability. At the same time, these tools need to ensure a just transition across countries and societies, secure and improve future generations' wealth, while minimizing greenwashing risks to avoid erosion of public and investors' trust in green transition.

**Shifting away from financing unsustainable activities is key with a focus on sectors and activities that currently most contribute to climate change and biodiversity loss** which is closely related to climate change ambitions. Many of these sectors are overlapping for biodiversity and climate issues, in particular, the energy sector (transport, buildings and industry), agriculture and food systems, cement, chemicals, and waste (see Figure 9).

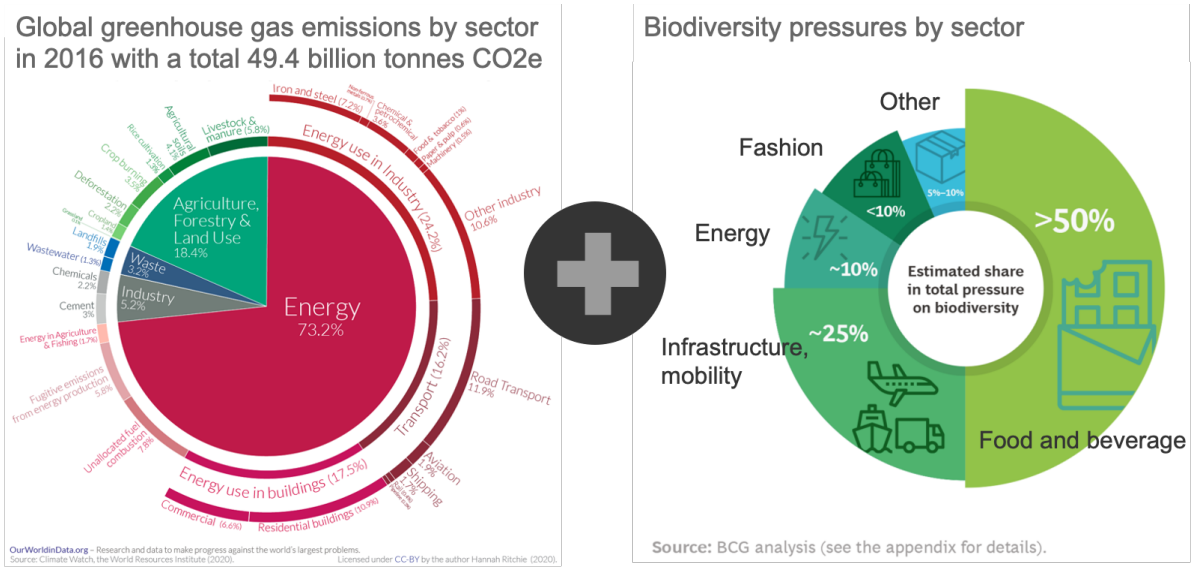


*Figure 9: Global Greenhouse Gas Emissions by Sector in 2016 (Source: Our World in Data 2020 [71])*

**Ministries and regulators responsible for climate and environment have an opportunity to set environmental standards and thresholds, data standards, as well as create architectures of carbon markets and environmental rights markets.** Close cooperation with related ministries responsible for public finance and SOEs, banking, financial markets, and economy, in addition to private sector stakeholders, promises the most effective results.

As institutional settings vary between G20 members, any systematic approach between top-down and bottom-up approaches will be specific to each country. The overall approach is ideally harmonized among the G20 members to create lower cross-border financing barriers.

**Scaling of green finance requires synergies between top-down and bottom-up action:** The top-down action sets policy signals and regulatory frameworks, such as disclosure regulations, public finance strategies, environmental standards (e.g., emission standards), or environmental rights trading markets (e.g., carbon markets), as well as monetary and fiscal incentives. The bottom-up actions set market-driven voluntary green financing instruments like ESG products, private sustainability markets for green goods, services and commodities, voluntary carbon offset markets to support corporate targets like net zero or nature positive goals. A key objective is to build synergies between these two green finance sources.

## 4.2 Integration of climate factors into finance system

G20 members have embarked on the journey to incorporated climate factors into financing frameworks, strategies and mechanisms

Based on the Addis Ababa Action Agenda [67], integrated national finance frameworks (INFFs) are envisaged to "align the full range of financing sources -domestic and international sources of public and private finance - and the policies that govern them for sustainable development." Successful evaluation has been completed, e.g., for Indonesia and Mexico. The Sustainable Banking and Finance Network [17] tracks progress of frameworks to promote sustainable finance of many developing countries (including relevant G20 members, such as China, India, Indonesia, Mexico).

The UK's 2019 Green Finance Strategy [68] similarly sets out how to harness the strength of the UK's world leading financial sector to catalyze green investment and accelerate delivery of net zero. The Net Zero Strategy [69] outlines measures to transition to a green and sustainable future, including the goal to leverage up to £90 billion of private investment by 2030.

The Government of Indonesia works on the Climate Change Fiscal Framework to implement several activities such as green budgeting, a Private Sector Climate Expenditure, and Institutional Review. Indonesia has developed a more advanced green finance framework than most its peers, being evaluated at the second highest stage in the SBFN 2022 evaluation [70]: "its national framework extends beyond the banking sector and promotes ESG integration across the financial sector ecosystem. In addition to ongoing activities to raise awareness and build capacity, implementation tools and initiatives are in place". Indonesia has also used public finance to develop green capital markets (e.g., issuance of third green sovereign sukuk worth US$750 million in 2020, and the state-owned Bank Mandiri issued its first US$300 million bond in 2021).

The EU's efforts are pooled in the EU's Strategy for Financing the Transition to a Sustainable Economy [41] that includes the 2021-2027 Multiannual Financial Framework (MFF) and Next-Generation-EU (NGEU). Through this, the EU aims to mobilize private finance through up to EUR 605 billion on public finance for projects addressing the climate crisis and EUR 100 billion in projects supporting biodiversity. Of the EUR 750 billion allocated for NextGeneration-EU, 30% will be raised through issuance of NGEU green bonds, which will further develop green capital markets in the EU. Furthermore, through its Just Transition Mechanism, the EU aims to "ensure that the transition towards a climate-neutral economy happens in a fair way, leaving no one behind. It provides targeted support to help mobilize around €55 billion over the period 2021-2027 in the most affected regions, to alleviate the socio-economic impact of the transition".

Ideally climate factors can be further organized in comprehensive and reinforcing green financial frameworks based on the relevant governance system, laws and regulations, sources of finance and relevant financial instruments.

## 4.3 Technologies for climate and green finance

To advance climate finance, a key bottleneck is informational asymmetry and transaction cost of data disclosure of environmental and climate risk. G20 members can take advantage of emerging technologies through the integration of big data, sensing technologies, enhanced (artificial) intelligence technologies, mobile platforms, blockchain technologies. These "digital finance" technologies make large amounts of data available more quickly at lower costs, increasing transparency and access to information related to sustainable investments. They also have the potential to promote greater inclusion and innovation, increase opportunities for citizen participation in the financial value chain and unlock new sustainable business models.

Many G20 members have established industry and government competence to utilize technologies to advance the provision and efficiency of financial services – not least through central bank digital currencies (CBDC) (e.g., Brazil, Japan, and others). Tech Sprint organized by the Bank for International Settlement (BIS) and G20 in 2021 focused on green and sustainable finance focused on three topics: (1) data collection, verification and sharing; (2) analysis and assessment of transition and physical climate-related risks, and (3) better connecting projects and investors.

Overall, digitalization or technologies have specific advantages for climate and sustainable finance to improve informed decision-making for regulators, investors and consumers based on improved data availability, transparency, comparability, as well as better data analyses, e.g., for climate scenario analyses, understanding of interdependencies (e.g., of nature-climate nexus risks):

- Collection of non-financial environmental data through smart technologies, sensing and autonomous vehicles (e.g., drones), e.g., for climate-related emissions at the source, pollution at the source, land-use change;

- Improvement of transparency and consistency through provision of data and information via openly accessible platforms, including through mobile platforms;
- Improvement of comparability of data through utilizing algorithms to interpret data through artificial intelligence, e.g., in the highly fragmented ESG data space or for multiple frameworks for environmental disclosure and risk management frameworks;
- Improvements in intelligence through better scenario analyses and stress testing, as well as risk analyses of interdependencies (e.g., nature) through higher data availability and improved computing power.

Furthermore, technologies can help mobilizing finance for green projects through reduction of transaction cost and information cost for investors. For example, the BIS Innovation Hub together with Hong Kong Monetary Authority (HKMA) established the Project Genesis in 2021 that allows any investor to invest any amount into safe government green bonds via an app. Over the bond's lifetime, the investor can see accrued interest, track in real time how reduction in $CO_2$ emissions linked to the investment are made. Further, the investor can sell the bonds in a transparent market.

# 5. Actions to be taken: Stop counterproductive, mobilize green public and private finance through smart, coherent, and tailored policy tools

Based on the identified developments of climate and green finance in G20 members, the identified gaps and the need for improvements, specific actions that G20 leaders in regulatory bodies responsible for climate change and biodiversity loss can consider have been identified.

**Climate finance actions considered by G20 members are based on five dimensions:**

1: With limited resources and time available, G20 members focus efforts on shifting finance away from those economic activities with the highest negative impact.

2: Public finance through fiscal spending, tax policy, state-owned-enterprises (SOEs) and state-owned financial institutions leads the race to the top in collaboration with the private sector finance.

3: Climate finance is fully integrated with biodiversity aspects to maximize effects of the green and sustainable transition for mitigataion and adaptation/resilience.

4: G20 encourages jurisdictions to develop their own green finance approaches based on the 6 principles noted by the SFWG

   a. SWFG Principle 1: Ensure material positive contributions to sustainability goals and focus on outcomes;

   b. SWFG Principle 2: Avoid negative contribution to other sustainability goals (e.g., through do no significant harm to any sustainability goal requirements);

   c. SWFG Principle 3: Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition;

   d. SWFG Principle 4: Reflect good governance and transparency;

   e. SWFG Principle 5: Be science-based for environmental goals and science- or evidence-based for other sustainability issues; and

   f. SWFG Principle 6: Address transition considerations.

5: Climate finance enables a just transition for countries in different development stages, for different sectors and ensure a better life for future generations rooted in the SDGs

Specific actions that G20 members can consider can be distinguished in (1) harmonized standards for public and private finance, (2) private sector mobilization, and (3) just and development finance.

### 5.1.1 Improving standardization to shift from unsustainable to green

**Improving interoperability of various green and sustainable finance standards for private and public finance** to reduce transaction cost, to ensure positive impact, to reduce greenwashing, to build trust and to shift from dirty to green finance can be developed.

While development of green taxonomies with a focus on mitigation has been increasingly successful and efforts to improve interoperability of green taxonomies are ongoing,

**definitions of counterproductive and hard-to-abate economic activities through a "traffic light classification system"** are paramount. This has the potential to increase economic costs for environmentally harmful activities and shift money to non-harmful and green activities. The classification system of those economic activities should focus on e.g., fossil fuel energies, transport-related infrastructure and services, agriculture and food systems, and resource extraction.

To reduce greenwashing, environmental regulators can support in providing and enforcing legal standards on **environmental thresholds and performance indicators** (i.e., technical screening criteria). These thresholds should describe what are maximum emissions and nature-negative outputs allowable (e.g., what are emission thresholds or biodiversity loss thresholds for specific activities) and provide performance indicators (e.g., what is considered a "positive biodiversity contribution" in different ecosystems and sectors). These thresholds are relevant for the inclusion/exclusion of economic activities in green finance taxonomies, as well as reporting.

Similarly, as a basis for evaluating environmental performance, **standards development for measuring, verifying, and reporting (MRV) comparable and standardized data on environmental performance** that includes vulnerable groups can be accelerated. This should utilize digital technologies available that should provide better access to all stakeholders including regulators, market participants and consumers. Technologies should advance climate and environment data management, to allow financial markets/entities to capture risk and opportunities of climate friendly investment/business/finance. The data quality should be ensured and enforced through standards supported or issued by competent environmental regulators. The competent environmental regulator can also provide regularly updated baseline environmental data on a granular level as well as performance summaries in relation to climate, biodiversity, pollution, and adaptation.

**The foundation for global markets and relevant instruments to accelerate carbon-positive and nature-negative investments provides broader benefits if it is improved. This includes a consensus for global and cross-border carbon pricing and carbon leakage avoidance,** where the parts of the proceeds can be utilized to support climate mitigation/adaptation/just transition in least developed countries including capacity building and technical assistance. Furthermore, tools for further natural rights trading can be implemented to increase the use of ecosystem-based solutions as carbon offsets within Paris Agreement Article 6 consensus reached at Glasgow [42] and to build resilience.

**Data that is made publicly** and easily available has a greater potential to improve transparency and trust in green finance e.g., through a shared data repository, to evaluate relevant incentives and disincentives for aligning flows with sustainable development and climate targets and to facilitate smart climate financing decision making for example, for restructuring debts in developing countries, better standardize labelling of activities (e.g., green, and red taxonomy).

### 5.1.2 Private sector mobilization

These "traffic light system" standards can be applied for **public finance that includes, e.g., fiscal spending, subsidies, tax policy, state-owned enterprises (SOEs) and state-owned financial institutions.** Public financial and project engagement in non-SDG aligned or projects doing harm to an SDG can be ended by 2025 while state-owned financial institutions phase-out and divest from harmful projects by 2040. Exceptions can be provided to invest in harmful projects if they accelerate green development goals, such as when investing in a fund for early retiring coal-fired power plants.

Availability of green public finance can be increased through issuance of sovereign or SOE green financial instruments (e.g., green bonds, green sukuk).

With more green public finance, through sovereign or SOE green financial instruments (e.g., green bonds, green sukuk) green private sector spillovers and a mobilization of green private sector finance and businesses can be envisaged. By supporting governments, SOEs and SOFIs to utilize green financial instruments (e.g., green bonds), **local green capital market development** with immediate benefits for private sector development can be achieved.

The global infrastructure development facilities (e.g., Global Infrastructure Facility (GIF), Global Environment Facility (GEF)) and other applicable finance instruments (e.g., non-sovereign guarantees, blended finance, PPP) can be used for more efficient crowding in of commercial development finance and private finance in high-risk assets if accelerated, e.g., through capacity building for application and implementation of these financing mechanisms.

As private sector finance requires clear policy directions to understand regulatory risk (rather than uncertain future announcements), clear, ambitious green regulatory and policy targets paired with public finance measures will mobilize private sector finance to support phase-out of dirty assets and deployment of climate-friendly investments.

### 5.1.3 Just and development finance

**Ensure a globally just transition through responsibilities to ensure a just transition and reduce COVID-19 related impacts particularly in developing countries.** This should include the fulfillment and ideally increase of the US$100 billion climate finance from developed to developing countries.

Furthermore, G20 members can work together to **reduce debt-burdens of highly indebted countries** that include the evaluation of multilateral and bilateral debt-for-nature and/or debt-for-climate swaps to increase both development finance and fiscal space in highly indebted countries.

The development cooperation can also support **financial and technical capacity** particularly for energy transition (e.g., grid, energy storage) and adaptation finance possibly through multilateral agencies that would reduce risks of strategic national competition in development support.

To further finance the green transition in G20 members and beyond, **the use of global infrastructure development facilities (e.g., GIF, MCDF) and other applicable finance instruments that provide for more efficient crowding in of commercial development finance can be accelerated.** Also, the local (green) capital market development can be further supported.

# 6. Appendix

## 6.1 Appendix 1: Overview of relevant taxonomies

| | |
|---|---|
| EU taxonomy for sustainable activities | The EU taxonomy is a classification system, establishing a list of environmentally sustainable economic activities. The EU taxonomy would provide companies, investors, and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable. |
| China Green Bond Endorsed Projects Catalogue | The 2021 Edition Catalogue divides green projects into six major areas: Energy-saving and Environmental Protection Industry, Clean Production Industry, Clean Energy Industry, Eco-environment Industry, Green Upgrading of Infrastructure, and Green Services. |
| China "Traffic Light System" for Overseas investments | In 2020, China's Belt and Road Initiative International Green Development Coalition (BRIGC) backed by multiple ministries issued the Green Development Guidance for BRI projects with a "Traffic Light System". Projects are classified in "green" (environmentally beneficial without any significant harm to biodiversity, pollution and/or climate), "yellow" (environmentally neutral), and "red" (significant potential harm to any environmental dimension of pollution, biodiversity, or climate). |
| Indonesia's Green Taxonomy [38] | In January 2022, Indonesia's Financial Services Authority (OJK) completed the first edition of Indonesia's green taxonomy. The Green Taxonomy classifies sustainable financing and investment activities into three categories, namely: green (do no significant harm, apply minimum safeguard, provide positive Impact to the environment, and align with the environmental objective of the taxonomy, yellow (do no significant harm), and red (harmful activities). |
| The "EU-China Common Ground Taxonomy – Climate Change Mitigation (CGT)". | CGT put forward commonalities from the EU and China's taxonomies and provide generic methodologies for benchmarking taxonomies. As emphasized by the working group, the CGT has no legal implications and does not intend to be formally or legally endorsed by any jurisdictions. It is rather a source of inspirations and provides analytical toolkits for other jurisdictions when developing their own taxonomies. |

| | |
|---|---|
| ASEAN Taxonomy | The new taxonomy follows previous ASEAN sustainable finance initiatives, such as the ASEAN Green, Social and Sustainability Bond Standards, and the ASEAN Sustainable Banking Principles. The ASEAN Taxonomy is a sustainable finance taxonomy with an initial focus on environmental objectives. It consists of two parts. The base is a Foundation Framework (FF) resting on four environmental objectives and two essential criteria to guide AMS in classifying economic activities in 3 tiers (green-amber-red). |
| Singapore "Traffic Light System" 73 (not a G20 country, but with significance for financial markets in ASEAN and beyond) | The Green Finance Industry Taskforce (GFIT), convened by the Monetary Authority of Singapore (MAS), issued a proposed taxonomy for Singapore-based financial institutions to identify activities that can be considered green or transitioning towards green. A "traffic-light" system was developed, which sets out how activities can be classified as green, yellow (transition), or red according to their level of alignment with environmental objectives. |
| Japan Transition Finance Taxonomy | The Basic Guidelines on Climate Transition Finance (Guidelines) is one measure supporting this development strategy through strengthening the position of climate transition finance in Japan, especially in hard-to-abate sectors. In addition to its main objective, the Guidelines aims to introduce more funding contributing to achieving the 2050 carbon-neutral goals of Japan and align with the Paris Agreement. |
| Russian Green Finance Taxonomy | The Russian Green Finance taxonomy covers both green and transition activities. It is compatible with recognized international taxonomies and reflects criteria for sustainable projects. Green taxonomy section covers activities in such areas as waste management, energy sector (including the whole spectrum of low-carbon energy solutions: solar, wind, geothermal power, biofuels, hydropower, nuclear and hydrogen), circular economy projects, CCUS, energy efficiency in buildings, industrial processes (steel, aluminum, cement, etc.), transportation fuels, vehicles and infrastructure, green mobility, land use and agriculture.<br><br>Transitional taxonomy introduces criteria that encourage GHG emissions reduction in hard-to-abate sectors, namely, fossil fuel and natural resources exploitation and use |

## 6.2 Appendix 2: Overview of Sustainable financial instruments

| Category | Name | Aim/Scope | Status and scale | Examples in G20 |
|---|---|---|---|---|
| **Climate finance policies and regulations as a basis for climate finance instruments** | Green monetary policy | Central banks and other banking authorities are increasingly using their tools to provide the right price signals and incentives to align finance flows with climate goals [74]. | G20 central banks generally failing [75] | European Central Bank [75] etc. |
| | Green financial and real-economy policies | - Stress testing to improve financial institutions resilience<br>- Mandated disclosure of climate risks<br>- Legal requirements for real economy (e.g. the energy, transport, agriculture, or water sectors) | Very few G20 members implemented these instruments | People's Bank of China [76] for stress testing;<br>NDC priority sectors; |
| | Climate-related financial disclosures | Strategies, voluntary disclosures, standards or frameworks, roadmaps, guidance documents, etc. (nonbinding) | Very few G20 members implemented these instruments | TCFD |
| | Carbon pricing scheme (e.g., carbon tax, carbon market) | Put a price on carbon emissions so that the costs of climate impacts and the opportunities for low-carbon energy options are better reflected. | - Almost half of all $CO_2$ emissions [77] from energy use in G20 economies are priced as of 2021<br>- Carbon prices have increased across G20 economies | Korea, Canada, Germany, China etc. |

| Category | Name | Aim/Scope | Status and scale | Examples in G20 |
|---|---|---|---|---|
| **Risk management** | Energy savings insurance (ESI) | Address investment barriers to energy efficiency upgrades at small and medium enterprises (SMEs). | - Secondary replication in Europe led by GCF and IDB<br>- Finance mobilized reached USD 250 million in 2018 [78] | Mexico, Brazil, Italy, India, Turkey |
| | Long-Term Foreign Exchange Risk Management instrument | Address currency and interest rate risk for renewable energy finance and climate investment in developing<br>economies. | - Implemented by TCX (established by a group of multilateral development banks in 2015)<br>- 30mn EUR [78] investment from BMU IN 2015<br>- 30mn EUR from BMU in 2018<br>- - 31mn EUR from UK DFID in 2019 | Germany, UK |
| **Financing mechanisms and instruments** | Green concessional financing (e.g., loans) | Provide early-stage project development, construction financing, and refinancing to wind, solar, and run-of-river hydro projects in low income, lower-middle-income, and upper-middle income countries | - Usually provided by MDBs and DFIs used for climate mitigation purposes<br>- Almost all MDBs and DFIs have a climate portfolio with some concessional loan | G20 |

| Category | Name | Aim/Scope | Status and scale | Examples in G20 |
|---|---|---|---|---|
| **Financing mechanisms and instruments** | National climate funds | Collect, blend, and manage all incoming revenues streams (both international and national) related to climate change into centralized and nationally owned fund to allocate resources to green projects | - US$1.4 billion Amazon Fund (Brazil) with contributors from Germany, Norway, Malaysia<br>- Green Climate Fund South Africa | For an overview see the BU national climate fund tracker |
| | International climate funds | Often funded through international governments and/or development finance institutions, these funds pool money to provide low-cost, long-term financing to lower the risk and cost of climate financing applying different financing instruments (e.g., grant, concessional debt, guarantees, equity instruments, blended finance) | - US$10.3 billion Climate Investment Funds (CIF) established in 2008<br>- US$10.3 billion, Green Climate Fund (GCF) | |
| | Green non-concessional loans | Provide green credit for aligned projects through commercial financial institutions at market rates (e.g., while the financial institution might be able to provide lower financing rates due to re-financing options) | - China's green credit market reached about US$2.6 trillion in 2021 | China |
| | Green/transition bonds | Support specific climate-related or environmental projects (or projects transitioning from brown to green) on concessional terms | - One of the earliest and largest type of climate finance instruments;<br>- volumes included in the Climate Bonds Green Bond Database in 1H 2021 period reached USD227.8bn | EU, China, USA, etc. |

| Category | Name | Aim/Scope | Status and scale | Examples in G20 |
|---|---|---|---|---|
| **Financing mechanisms and instruments** | Insurance instruments (e.g., insurance-linked securities, contingent credit, and loans) | Cover risks from weather-related disasters in a combination of risk prevention and risk transfer mechanism | - Swiss Re, The Nature Conservancy and regional governments in Mexico in "underwriting nature" initiative to protect the Mesoamerican coral reel [79] | Mexico |
| | Multilateral/bilateral/ national grants | Grants can be offered by policy and private institutions to accelerate investments, e.g., through blended finance, that allows to crowd in private capital even in non-revenue or negative yield projects, including capacity building or technical plans | - Multilateral development banks (ADB, World Bank) provide grants for capacity building<br>- KfW provides grants for energy efficient renovation of private houses<br>- Large foundations (e.g., Gates Foundation, CIFF) provide grants for capacity building on climate change | G20 |

| Category | Name | Aim/Scope | Status and scale | Examples in G20 |
|---|---|---|---|---|
| **Financing mechanisms and instruments** | Financing facilities | Lending facility intended to increase climate-related investments by addressing market constraints and using blended finance to crowd-in private investments, for example in infrastructure, but also provides capacity building and knowledge sharing | - Green Climate Facility by IDB)<br>- Climate Finance Facility South Africa by DBSA<br>- Global Environmental Facility established in 1992<br>- Global Infrastructure Facility (GIF) established by G20 with total investments of US$76 billion<br>- MCDF established in 2021 by China and others | |
| | Guarantees | Guarantees help mitigate risks from investments to lower the threshold for private investors to invest; guarantees can cover the entire investment or parts thereof; | - Performance or credit guarantees to cover the risk of a contracted power off-taker in renewable energies;<br>- IDB provides guarantees for the geothermal development in Chile and Mexico [80] | |

| Category | Name | Aim/Scope | Status and scale | Examples in G20 |
|---|---|---|---|---|
| **Financing mechanisms and instruments** | Climate finance auctions | An alternative to traditional public climate finance, used to set a price floor for emission reductions which give auction winners the option of selling emission reductions to a public funder at a fixed price or to the market. | - Relatively new instrument but with a proven track record [81]. | World Bank's Pilot Auction Facility for Methane and Climate Change Mitigation (PAF); UK Contracts for Difference (CfD) programme |
| | Coal exit financing mechanisms | Develop tools and incentives to retire coal-fired power plants ahead of schedule | - Energy Transition Mechanism (ETM) by ADB launched in 2021<br>- Accelerating Coal Transition (ACT) US$2.5 billion fund launched by CIF in Nov 2021<br>- Reverse auctions in Germany | |
| | Sustainability Linked loans | Incentivize borrowers (not restricted to projects) to improve their overall sustainability performance | - exponential increase in size and activity in recent years<br>- $40 billion [82] of announced sustainability linked loan globally in the first six weeks into 2022 | Especially US |
| | Debt-for-climate/nature swaps | debt swap in which the debtor nation refinances and makes payments in local currency to finance climate/nature protection projects | Relatively small at hundreds of million-level per transaction | Paris Club members |

## 6.3 Appendix 3: Selected reporting standards

| Category | Name | Apply to | Content | Status |
|---|---|---|---|---|
| Government | EU Sustainable Finance Disclosure Regulation (SFDR) | All financial market participants ("FMPs") and financial advisors ("Fas") in the EU, FMPs with EU shareholders, and those marketing in the EU | It imposes comprehensive sustainability disclosure requirements covering a broad range of ESG metrics at both entity- and product-level. | Applicable in March 2021; Level 2, which starts in 2023, will require companies to justify their activities |
| | Recommendations to public joint stock companies on the disclosure on non-financial activities | Public joint stock companies in Russia | It encourages public companies to disclose information about how they consider ESG factors and how they implement these factors into their business model and development strategy. | Launched in July 2021, no recent update |
| | Administration Measures of Law-based Disclosure of Environmental Information by Enterprises | Certain high-polluting enterprises in China | It requires in-scope enterprises to disclose environment and pollution related information in annual reports. | Applicable in Feb 2022 |
| | 1. the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022<br>2. the Limited Liability Partnerships (Climate-related Financial Disclosure) Regulations 2022 | All UK registered companies and Limited Liability Partnerships (LLPs) with over 500 employees having annual revenue of more than £500 million. | These revised regulations require organizations to disclose climate-related financial information and ensure they consider the risks and opportunities they face because of climate change. | Regulations passed in January of 2022 with an effective date of 6 April, 2022 |

| Category | Name | Apply to | Content | Status |
|---|---|---|---|---|
| | The US Securities and Exchange Commission (SEC) Interpretive Guidance Regarding Disclosure Related to Climate Change | US public companies | It provides guidance to public companies regarding the<br><br>Commission's existing disclosure requirements as they apply to climate change matters. | First published in 2010; SEC has proposed rules to enhance and standardize climate-Related disclosures in 2022 |
| | Disclosure Guidelines for the Financial Sector | Financial sector in China | It puts forward requirements on details to be disclosed by Chinese financial institutions on environmental information, and provides guidance for different financial sub-sectors such as commercial banks, asset management, insurance. | Launched by People's Bank of China in Aug 2021 |
| Market | NASDAQ ESG Reporting Guide 2.0 | All Nasdaq markets | It is a voluntary initiative and aims to help both private and public companies navigate the evolving standards on ESG data disclosure. | Published in 2019 as an updated version of the 2017 guide, incorporating new developments (such as TCFD, SDGs, GRI Standards, EU NFR Directive) |
| | New York Stock Exchange ESG Guidance and Best Practices | NYSE listed companies | It highlighting key elements of good quality reporting and provides guidance on voluntary sustainability reporting. | Provides resources for companies to report in line with frameworks like GRI, SASB, TCFD |

| Category | Name | Apply to | Content | Status |
|---|---|---|---|---|
| | Euronext ESG Reporting Guide: Target 1.5°C | Euronext issuers and private companies | It provides guidance for companies to identify and prioritize ESG opportunities and risks; report efficiently; navigate, comply with and stay ahead of regulations and differentiate themselves in terms of their ESG approach. | New edition announced in May 2022 |
| | Johannesburg Stock Exchange (JSE) 1.Sustainability Disclosure Guidance<br><br>2. Climate Change Disclosure Guidance | Serve as a guidance tool that may be used by JSE issuers on a voluntary basis | It is aligned with global expectations and best practice, and specifically tailored to the South African business context, serving as an umbrella for<br><br>topic-related guidance as needed. | Draft open for public comment from 9 December 2021 – 28 February 2022 |
| | Singapore Exchange (SGX) sustainability reporting guide (not a G20 country, but with significance for financial markets in ASEAN and beyond) | SGX listed companies | SGX-ST requires each issuer to publish an annual sustainability report, describing the primary components on a 'comply or explain' basis, and in relation to the primary component in Listing Rules. | Effect from 1 January 2022, issuers are required to describe their sustainability practices on a "comply or explain" basis with reference to climate-related disclosures consistent with the TCFD recommendations. |

| Category | Name | Apply to | Content | Status |
|---|---|---|---|---|
| | Shanghai Stock Exchange & Shenzhen Stock Exchange Guidelines | Listed companies | These guidelines encourage listed companies to disclose information related to social responsibility and environmental impact, among others. | Launched in Jan 2022 by both two exchanges |
| Sector-led | Task Force on Climate-related Financial Disclosure (TCFD) | All organizations, especially organizations with public debt<br><br>or equity | A voluntary set of guidelines aimed at assessing a company's exposure to climate change risk. It provides both general and sector-specific guidance<br><br>to assist organizations with implementing the TCFD recommendations. | As of Sep 2021, 12 governments and dozens of central<br><br>banks, supervisors, and regulators have formally expressed support for the TCFD recommendations,<br><br>and more than 2,600 organizations have now endorsed them, an increase of over 70% since last year. |

| Category | Name | Apply to | Content | Status |
|---|---|---|---|---|
| | Taskforce on Nature-related Financial Disclosures (TNFD) | The TNFD framework is intended for use globally by corporates and financial institutions of all sizes. | A risk management and disclosure framework for organizations to report and act on evolving nature-related risks, which aims to support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes. | In March 2022, TNFD released the first beta version of the framework for a 18-month market consultation. A further three iterations of the beta versions are planned – June 2022 (v0.2), October 2022 (v0.3) and February 2023 (v0.4) – before the release of the final version v1.0 of the framework in Q3 2023. |
| | Carbon Disclosure Project (CDP) | Global companies or cities | The CDP (formerly the Carbon Disclosure Project) is an international non-profit organization that aims to make environmental reporting and risk management a business norm, driving disclosure, insight, and action towards a sustainable economy. | Since 2002 over 8,400 companies have publicly disclosed environmental information through CDP. |
| | The Sustainability Accounting Standards Board (SASB) | Global reporting companies and investors | SASB Standards guide the disclosure of financially material sustainability information by companies to their investors. Available for 77 industries, the Standards identify the subset of ESG issues most relevant to financial performance in each industry. | The number of unique SASB Reporters since 2020 is 1858, with the number of 2022 YTD being 736. The total number of member organizations in SASB Alliance reached 281, representing 28 countries. |

| Category | Name | Apply to | Content | Status |
|---|---|---|---|---|
| | Global Reporting Initiative (GRI) | Global companies | GRI is the independent, international organization that provides GRI standards for sustainability reporting. The GRI Standards include three series of Standards to be used together: Universal Standards, Sector Standards, and Topic Standards | Around three-quarters (73%) of the world's largest 250 companies and two-thirds (67%) of the N100 (5,200 companies comprising the largest 100 firms in 52 countries) now use GRI. |
| | IRIS+ | Impact investors in particular | IRIS+ is managed by the Global Impact Investing Network (GIIN) and is the generally accepted system for measuring, managing, and optimizing impact. | Over 27,000 users have registered to use IRIS+ materials. |

## 6.4 Appendix 4: Selected sustainable finance initiatives and standard setters

| Lead Organization/Name | Content | Type of organization |
|---|---|---|
| Coalition of Finance Ministers for Climate Action | The Coalition will help countries mobilize and align the finance needed to implement their national climate action plans; establish best practices such as climate budgeting and strategies for green investment and procurement; and factor climate risks and vulnerabilities into members' economic planning. | Government |
| Development Assistance Committee, OECD (OECD DAC) | DAC Principles for Evaluation of Development Assistance.<br><br>The OECD DAC measures and monitors bilateral development finance targeting climate change objectives using two Rio markers: climate change mitigation and climate change adaptation. | Government/multilateral |
| Finance to Accelerate the Sustainable Transition-Infrastructure initiative (FAST INFRA SI) | The FAST-Infra initiative launched the Sustainable Infrastructure (SI) Label – a consistent, globally applicable labelling system designed to identify and evaluate sustainable infrastructure assets.<br><br>The label aims to facilitate due diligence processes and structuring of investments for sustainable infrastructure assets, thereby reducing transaction costs. | Association |
| International Sustainability Standards Board (ISSB) | Established in November 2021 by the International Finance Reporting Standards Foundation (IFRS), the ISSB aims to deliver a comprehensive global baseline of sustainability-related disclosure standards that provide investors and other capital market participants with information about companies' sustainability-related risks and opportunities to help them make informed decisions. | Association |
| Network of Central Banks and Supervisors for Greening the Financial System<br><br>(NGFS) | The Network's purpose is to help strengthening the global response required to meet the goals of the Paris agreement and to enhance the role of the financial system to manage risks and to mobilize capital for green and low-carbon investments in the broader context of environmentally sustainable development. To this end, the Network defines and promotes best practices to be implemented within and outside of the Membership of the NGFS and conducts or commissions analytical work on green finance. | Government/regulator |

| | | |
|---|---|---|
| Principles of Responsible Investment (PRI) | The PRI is the world's leading proponent of responsible investment. It works:<br>- to understand the investment implications of environmental, social and governance (ESG) factors;<br>- to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions. | Association/multilateral |
| Sustainable Banking Network (SBN) | The Climate Action toolbox is a simple self-assessment tool to help reduce the carbon footprint of any business. It focuses on five key areas – transport (moving people and goods), office operations, site operations and equipment, and the design and making of products. | Regulator |
| The Glasgow Financial Alliance for Net Zero (GFANZ) | The Glasgow Financial Alliance for Net Zero (GFANZ) was launched in April 2021 by Mark Carney, UN Special Envoy for Climate Action and Finance and UK Prime Minister Johnson's Finance Adviser for COP26, and the COP26 Private Finance Hub in partnership with the UNFCCC Climate Action Champions, the Race to Zero campaign and the COP26 Presidency. Bringing together existing and new net-zero finance initiatives in one sector-wide coalition, GFANZ provides a forum for leading financial institutions to accelerate the transition to a net-zero global economy. Our members currently include over 450 financial firms across 45 countries responsible for assets of over $130 trillion. | Association |
| United Nations Environment Programme Finance Initiative (UNEP FI) | A partnership between UNEP and the global financial sector to mobilize private sector finance for sustainable development. UNEP FI works with more than 450 banks, insurers, and investors and over 100 supporting institutions – to help create a financial sector that serves people and planet while delivering positive impacts. We aim to inspire, inform, and enable financial institutions to improve people's quality of life without compromising that of future generations. By leveraging the UN's role, UNEP FI accelerates sustainable finance.<br>The frameworks UNEP FI has established or co-created include:<br>● Principles for Responsible Banking (PRB)<br>● Principles for Sustainable Insurance (PSI)<br>● Principles for Responsible Investment (PRI) | Association/multilateral |

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