Sustainable Finance: Global Contours and Architecture

09.09.2026

For a long time, the financial system treated environmental and social factors purely as externalities with no material bearing on returns or risk. The emergence of the sustainable development concept triggered a gradual shift in approaches to financing. In the absence of a unified global framework, regulation is increasingly taking shape at the level of individual regions and blocs, each developing its own rules based on national economic priorities.

The existing system is also fragmented across types of sustainable finance (green, social, nature, climate, and transition), each pursuing different objectives, which ultimately undermines the comparability of financing instruments and significantly increases market participants' transaction costs. Key challenges for the further development of this agenda therefore include overcoming structural market fragmentation, striking a balance between introducing universal baseline standards and preserving flexibility to reflect regional specificities, and creating mechanisms for the mutual recognition and comparability of existing approaches.

Concept

Sustainable finance is a system of financial instruments, mechanisms, and investment decisions that integrates environmental, social, and governance (**ESG**) factors into capital allocation and risk management in support of sustainable development goals. Sitting at the intersection of market initiatives, regulatory approaches, and international standards, sustainable finance has developed as an umbrella concept that, broadly defined, encompasses climate, green, social, nature, and transition finance.[1] Each of these strands has developed unevenly, with its own international approaches, principles, and regulatory frameworks. Such unevenness complicates the comparability of national approaches and disclosure standards, and reduces the transparency of the true scale of financial flows, both overall and within individual strands.

In broad terms, the essence of sustainable finance lies in changing how capital is allocated and risk is assessed across the global financial market. Environmental and social factors are being reclassified from non-financial matters into material risks and incorporated into central banks' prudential frameworks, national disclosure standards, and corporate strategic documents as elements of measurable impact on long-term economic development. In current practice, foremost among these are climate risks, which fall into two categories: physical risks, arising from the direct economic damage caused by climate change and environmental degradation, and transition risks, arising from the decarbonization of the economy and the structural transformation of industries.[2] Alongside climate risks, nature-related risks are also gaining increasing weight in central banks' prudential

Suggested citation: Kononovich, I.V., Gribanova, D.M. (2026). *Sustainable Finance: Global Contours and Architecture*. International and Comparative Law Research Center. https://doi.org/10.65556/GNYG9811

[1] In practice, there are numerous classifications of sustainable finance. Among the best-known is the ICMA framework, which structures sustainable finance into five strands (climate, green, nature, social, and transition).

[2] The classification of climate risks into physical and transition risks was first formally introduced by the Task Force on Climate-related Financial Disclosures (TCFD) in 2017. Its recommendations laid the groundwork for current reporting standards. URL

frameworks.[3] International non-financial reporting standards[4] serve as a tool for managing these risks: they enhance the transparency of cross-border capital flows and encourage companies to back their environmental commitments with economically sound transition strategies.

Instruments of Sustainable Finance

The architecture of sustainable finance is characterized by high dynamism and information asymmetry. Precisely assessing the aggregate volume of sustainable finance is difficult, owing to the fragmentation of disclosure standards and the emergence of new sustainability-related strands.

According to estimates by UNCTAD and the Institute of International Finance (IIF), the aggregate volume of publicly traded sustainable instruments exceeded $8 trillion in 2024.[5] Private capital dominates the overall volume of sustainable finance, accounting for 60–65% of the total and mobilized mainly through institutional investors in developed countries. Sustainable funds are one of the principal channels for deploying private capital: in 2024, this segment accounted for a cumulative $3.2 trillion, equivalent to 40% of total sustainable finance volume that year. The segment is overwhelmingly dominated by the EU and the US, which together held 95% of the global segment total in 2024 (EU — $2.7 trillion, or 84%; US — $344 billion, or 11%). Despite this substantial accumulated capital, however, net inflows of new funds into sustainable funds slowed markedly, falling by 40% in 2024.[6]

Debt instruments constitute a substantial share of the global sustainable finance market. By 2024, the cumulative stock of outstanding sustainable bonds had passed the historic $5 trillion mark,[7] while net annual issuance exceeded $1 trillion for the first time. By instrument class, this comprised green bonds ($672 billion, or 63.8%), social bonds ($166 billion, or 15.8%), sustainability bonds ($206 billion, or 19.6%), and sustainability-linked bonds ($8 billion, or 0.8%).[8] Geographically, more than 85% of the debt market — both annually and cumulatively — is concentrated in three regions: the EU ($474 billion, or 45%, in 2024), Asia-Pacific ($270 billion, or 25.7%), and North America ($170 billion, or 16%).[9]

As private capital shows high sensitivity to geopolitical shocks, public sources have become a strategic driver of the market, operating not only through direct budgetary channels (sovereign green bonds and green budgeting mechanisms) but also through development institutions via blended finance

[3] The Taskforce on Nature-related Financial Disclosures (TNFD) was the first to introduce a methodology for assessing measurable, material nature-related business risks.

[4] The global disclosure standards introduced by the International Sustainability Standards Board (ISSB) — IFRS S1 (General Requirements) and IFRS S2 (Climate-related Disclosures) — underpin the harmonization of most national reporting systems among the world's largest economies.

[5] Unless otherwise indicated, statistical data on aggregate sustainable finance volumes throughout this paper cover the period from 2020 to 2024. URL

[6] According to UNCTAD, this outflow resulted from a tightening regulatory environment and political opposition to ESG investing in the US (which triggered a net outflow of $20 billion in American capital), as well as from a general decline in the financial returns of sustainable strategies relative to conventional instruments. URL

[7] Taking a broader view of the debt market that also includes the non-tradable sustainable lending segment — which accounted for a cumulative total of more than $2.4 trillion in 2024 — the overall aggregate volume of debt instruments exceeded $7.4 trillion in 2024. URL

[8] Climate Bonds Initiative. (2025). Sustainable Debt: Global State of the Market 2025. URL

[9] By country, the leaders in sustainable debt issuance in 2024 were the US ($84.7 billion), followed by Germany ($73.3 billion) and China ($68.9 billion). URL

instruments.[10] The principal role of this mechanism is risk reduction: public bodies and multilateral development banks absorb first losses or provide guarantees, turning sustainable projects into more commercially attractive assets.[11] Despite the evident effectiveness of such instruments for low-margin projects and the least developed countries, however, their share of overall sustainable finance volumes remains extremely low[12] and falls far short of developing countries' needs.[13]

Global Context

Resolutions of the UN General Assembly, foremost among them the *2030 Agenda for Sustainable Development* (2015),[14] the *Addis Ababa Action Agenda on Financing for Development* (2015),[15] and subsequent instruments including the *Pact for the Future* (2024),[16] establish the political mandate for the development of sustainable finance, setting its overarching goals and priorities.

Despite the efforts of international institutions (such as the G20 Sustainable Finance Working Group (**G20 SFWG**)[17] and the International Platform on Sustainable Finance (IPSF)[18]), the scaling-up of the global sustainable finance market continues to be constrained by the high fragmentation of approaches and sovereign practices. An important step for the development of the global market is the emergence of initiatives at the level of intergovernmental groupings (such as BRICS[19] and the Shanghai Cooperation Organisation (**SCO**)[20]) that take into account the specific features of developing economies. Among regional integration blocs, the Association of Southeast Asian Nations (**ASEAN**) has achieved the greatest practical progress, having launched the ASEAN Taxonomy for Sustainable

[10] In 2024, blended finance volumes reached only $24 billion. URL. Blended sustainable finance flows are directed mainly to developing countries, including those in Latin America, sub-Saharan Africa, and India. URL

[11] The instruments used include first-loss capital, guarantees and sureties, and technical grants and subsidies.

[12] Within the global sustainable finance market ($8.2 trillion), official development assistance (ODA) and joint public–private blended transactions together accounted for less than 1.5% of the total volume of funds in 2024 (approximately $100–120 billion). URL

[13] The annual financing gap for achieving the SDGs in developing countries is estimated at $4.3 trillion, of which at least $1.8 trillion must be allocated annually to climate needs and infrastructure adaptation. URL

[14] UN General Assembly Resolution A/RES/70/1 (2015). URL

[15] UN General Assembly Resolution A/RES/69/313 (2015). URL

[16] UN General Assembly Resolution A/RES/79/1 (2024). URL

[17] Since 2021, the G20 Sustainable Finance Working Group (G20 SFWG) has been working on the comparability of approaches to aligning investment with the SDGs, improving sustainability reporting, and strengthening the role of international financial institutions in achieving the SDGs and the goals of the Paris Agreement. URL

[18] The International Platform on Sustainable Finance (IPSF) was established in October 2019 as an informal forum for coordinating public policy on sustainable finance, and brings together 22 jurisdictions accounting for more than 60% of global greenhouse gas emissions. In 2023, its members expanded the Common Ground Taxonomy (CGT), which maps the technical criteria of the EU Taxonomy and China's Green Bond Endorsed Project Catalogue, identifying economic activities that simultaneously meet the climate-mitigation requirements of both systems. In November 2024, the Multi-Jurisdiction Common Ground Taxonomy (M-CGT) was published, incorporating Singapore's taxonomy and mapping the criteria of three jurisdictions. The document serves as a voluntary reference for issuers, investors, and regulators, facilitating the comparability of national approaches.

[19] BRICS has established a Sustainable Finance Working Group (SFG), comprising experts and officials from the finance ministries and central banks of BRICS countries; its work focuses mainly on green and transition finance, as well as on reporting standards, risk assessment, and taxonomy development. URL

[20] In June 2026, members of the SCO Interbank Consortium approved a roadmap for developing cooperation on ESG, sustainable, and socially inclusive finance, envisaging deeper cooperation among member banks on sustainable finance, the exchange of practices, and the development of new financial instruments. URL

Finance. Its key feature, tailored to the needs of developing markets, is the introduction of a "traffic-light system" for classifying economic activities.[21]

The United Nations Environment Programme Finance Initiative (**UNEP FI**) is one of the key international platforms formulating practical standards for the global financial market. Developed under its auspices, the Principles for Responsible Banking (**PRB**),[22] the Principles for Sustainable Insurance (**PSI**),[23] and the Principles for Responsible Investment (**PRI**)[24] have become widely recognized market benchmarks. All three frameworks share a common operating mechanism: signatories gain access to international expertise and methodological tools in exchange for a commitment to report regularly and transparently on their progress.

Market practice in sustainable finance rests on a system of voluntary principles and standards. The vast majority of current sustainable bond issuances are governed by the Green, Social and Sustainability Bond Principles (**GSS Principles**) of the International Capital Market Association (**ICMA**), which set out requirements for the use of proceeds, project evaluation, and reporting.[25] In the loan segment, an equivalent role is played by the Green Loan Principles (**GLP**) and the Sustainability-Linked Loan Principles (**SLLP**) of the Loan Market Association (**LMA**). The GLP require the use of proceeds for designated purposes, evaluation of environmental projects, segregated tracking of funds, and annual reporting;[26] the SLLP require alignment with the borrower's ESG strategy, linkage to KPIs and ambitious Sustainability Performance Targets (**SPTs**),[27] and independent verification of results achieved.[28]

Country Approaches

In broad terms, sustainable finance is implemented at state level through the integration of environmental, climate, and social objectives into national strategies and plans, the creation of a regulatory framework (including classification systems (taxonomies), disclosure standards, sustainable finance instruments, and verification mechanisms), and the adaptation of international standards and principles to countries' economic realities. The number of policy measures aimed at regulating sustainable finance has grown steadily since 2015. In 2024 alone, G20 countries and leading emerging

[21] In 2021, ASEAN member states first adopted a voluntary, periodically updated taxonomy. Reflecting the region's differing levels of economic development, it is based on a tiered system: green, for activities aligned with global climate goals; amber, for transitional activities; and red, for activities that undermine sustainable development.

[22] As of 2026, more than 350 banks — representing around 50% of global banking assets — had signed up to the Principles. URL

[23] The Principles have more than 300 signatories. Key PSI workstreams include the Sustainable Insurance Facility of the Vulnerable Twenty (V20) Group of Finance Ministers, approaches to carbon-neutral and nature-positive insurance, ESG guidance, and support for implementing the recommendations of the TCFD and the emerging TNFD framework. URL

[24] The Principles require investors to incorporate ESG factors into investment analysis, practise active ownership, and press investee companies to disclose non-financial information. More than 5,000 institutional investors, managing over $140 trillion in assets, have signed up to the Principles. URL

[25] ICMA has more than 630 members, none of which are Russian companies. These standards are used extensively not only by private corporations but also by multilateral development banks, including the World Bank and the Asian, African, and Inter-American Development Banks. As of 2025, 96% of global sustainable bond issuance ($911 billion) was issued in line with these principles. URL

[26] Loan Market Association. Green Loan Principles. URL

[27] Sustainability Performance Targets (SPTs) are sustainability targets measured against key performance indicators (KPIs) chosen in advance by the company. They must be ambitious — going beyond a "business as usual" trajectory — while remaining consistent with the issuer's overall sustainability strategy. URL

[28] Loan Market Association. Sustainability-Linked Loan Principles. URL

economies, together accounting for more than 93% of global GDP, adopted 73 new regulatory measures, bringing the cumulative total for 2015–2024 to 580. The most common areas of activity were sustainability disclosure and the creation of framework mechanisms for integrating sustainable finance into national development strategies, in order to meet national commitments under the Paris Agreement.[29]

The development of this agenda across countries is nonetheless characterized by fragmented regulatory models. Existing national models of sustainable finance can be divided into several groups, differing in the maturity of their regulation and the priorities of government policy. Developed markets, for instance, are characterized by strict compliance requirements and the extensive application of international standards and principles, whereas emerging Asian markets and large growing economies prioritize state-led approaches focused on social development, technology, and transition finance.

EU member states have the most developed and institutionally comprehensive regulatory system. A comprehensive architecture has been established there, comprising a taxonomy of sustainable activities (the EU Taxonomy, Regulation 2020/852)[30] and mandatory disclosure requirements under the Sustainable Finance Disclosure Regulation (SFDR) and the Corporate Sustainability Reporting Directive (CSRD). High regulatory granularity does not, however, guarantee widespread use of the taxonomy: the proportion of green bonds aligned with the sustainable taxonomy remains low.[31]

Market-oriented approaches predominate in economies such as the UK,[32] the US,[33] Canada,[34] and Australia,[35] where regulation relies more heavily on voluntary principles, climate risk management, and disclosure. The UK stands out for its development of corporate decarbonization plans, while the US and Australia favour incentivizing private capital without establishing a strict, mandatory taxonomy.[36]

Japan and South Korea are marked by active state involvement in national industrial transformation. Japan views sustainable finance primarily as a tool for financing the transition of high-carbon

[29] UNCTAD. (2025). World Investment Report 2025. URL

[30] The EU Taxonomy sets out six environmental objectives and criteria for substantial contribution, the "do no significant harm" (DNSH) principle, and minimum social safeguards; it underpins mandatory disclosures under the SFDR and the CSRD. URL

[31] The cumulative volume of taxonomy-aligned green bonds issued by EU companies stood at only around €111 billion by the end of 2024 — no more than 10% of the annual volume of EU corporate green bond issuance. Given that green bonds themselves account for no more than 6.5% of all corporate issuance, taxonomy-aligned instruments represent less than 0.7% of total issuance. URL

[32] The UK's Green Finance Strategy (2019) established the integration of climate risk and the pursuit of net-zero carbon (URL); the *Greening Finance* roadmap (2021) set out a phased programme for mandatory sustainability disclosure (URL) and formed the basis for establishing the Transition Plan Taskforce (URL), which developed recommendations for preparing corporate climate transition plans.

[33] The US relies mainly on voluntary mechanisms; in 2023, the US Department of the Treasury issued its Principles for Net-Zero Financing and Investment. URL

[34] In 2025, Canada's financial regulator, the Office of the Superintendent of Financial Institutions (OSFI), introduced new rules on climate risk management for banks and insurance companies. URL

[35] In 2023, Australia published its Sustainable Finance Strategy, providing for improvements to the climate disclosure framework, greater availability and comparability of sustainability data, the development of a national taxonomy, and coordination between government bodies and financial regulators on managing climate risk and strengthening the resilience of the financial system. URL

[36] This is achieved, among other things, through the development of voluntary sustainable finance principles and disclosure standards, and the provision of financial incentives and credit.

industries,[37] while South Korea combines a mandatory national taxonomy with a phased introduction of ESG reporting.[38]

The models adopted by financial centres in Asia and the Middle East (Singapore and the UAE) are geared towards attracting international capital and promoting a unified set of standards. Singapore is developing a regional taxonomy that accounts for a transition period for Southeast Asian countries,[39] while the UAE is building a two-tier regulatory system that combines federal coordination with independent regimes in its international financial centres,[40] paying particular attention to sustainable Islamic finance.[41]

Large growing economies (China, India, Brazil, Turkey, and Russia) retain a significant role for the state and seek to combine the integration of existing global standards with the development of national taxonomies tailored to their jurisdictions' economic characteristics. China has one of the largest state-led green finance systems in the world and is gradually aligning its criteria with international approaches.[42] India is experiencing rapid growth in its sustainable debt market but is still at the stage of building a fully fledged regulatory framework.[43] Brazil[44] and Turkey[45] are relying on voluntary

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[37] In 2021, Japan's Ministry of Economy, Trade and Industry (METI), Ministry of the Environment, and Financial Services Agency (JFSA) published the Basic Guidelines on Climate Transition Finance, setting out national approaches to financing the decarbonization of the country's high-emission industries. URL

[38] South Korea's mandatory national taxonomy (the K-Taxonomy) divides activities into green and transition categories. URL. The state also subsidizes the interest costs of issuers of green bonds issued under K-Taxonomy criteria. URL

[39] Singapore is implementing the Singapore Green Plan 2030 (URL) and a Green Finance Action Plan aimed at developing the green finance ecosystem and supporting economic resilience. URL. Its key element is the Singapore-Asia Taxonomy (SAT), launched at COP28, a multi-sector taxonomy that sets out detailed transition criteria. It covers eight sectors (accounting for more than 90% of Southeast Asian emissions) and is built on the same "traffic-light" principle as the ASEAN Taxonomy for Sustainable Finance. URL

[40] The UAE is building a two-tier system for regulating sustainable finance: coordination at the federal level is carried out by the Sustainable Finance Working Group (URL), while the international financial centres of the Abu Dhabi Global Market (ADGM) and the Dubai International Financial Centre (URL) apply their own independent requirements for ESG disclosure and the regulation of sustainable financial products.

[41] The UAE is seeking to develop sustainable Islamic banking; to this end, Guidelines for Promoting Sustainable Islamic Finance were adopted in 2023. URL

[42] China uses its own Green Bond Endorsed Project Catalogue, which has evolved from the first list published in 2015 — which included "clean coal" technologies — to the 2025 version, which fully excludes fossil fuels and unifies the previously separate lists maintained by the People's Bank of China and the National Development and Reform Commission. URL. Renamed the Green Finance Endorsed Project Catalogue in 2025, the document is structured by sector. URL. The current version covers categories such as energy conservation and carbon emission reduction, environmental protection, the circular use of resources, the transition to clean, low-carbon energy, ecological protection and restoration, green infrastructure upgrades, and green services, trade, and consumption.

[43] In late 2025, the Reserve Bank of India (RBI) issued the Commercial Banks — Climate Finance and Management of Climate Change Risks Directions, aimed at integrating climate risk into borrower-assessment models used by commercial banks and large non-bank financial institutions. India also developed a voluntary national climate taxonomy in 2025 (India's Climate Finance Taxonomy), aimed at mobilizing approximately $250 billion annually for climate and transition projects. URL. The Indian government has experience issuing sovereign green bonds, and India's sustainable debt market has exceeded $55.9 billion, with green bonds and designated loans accounting for 83% of this total. URL

[44] Brazil's Sustainable Taxonomy, adopted in late 2025, guides companies on sustainability reporting and verification and includes a system of financial incentives for measures aligned with environmental and social principles. URL. In parallel, the Securities Commission (CVM) and the Central Bank of Brazil established a regulatory framework for applying ISSB standards (IFRS S1 and IFRS S2). The original plan envisaged a transition to mandatory reporting; however, in May 2026, the CVM eased these requirements in Resolution No. 244, replacing the mandatory regime with a voluntary one. URL

[45] In 2021, the Turkish government published a draft National Green Taxonomy, providing for mandatory reporting by banks, investment firms, insurance companies, and other entities from 2027. URL. In parallel, the Public Oversight, Accounting and Auditing Standards Authority (KGK), supported by the Capital Markets Board (CMB), is progressively introducing mandatory

national taxonomies and the harmonization of disclosures with ISSB standards, which are planned to become mandatory within a few years. Russia has adopted a sustainable finance methodology[46] and introduced risk-based incentives for banks,[47] although ESG disclosure remains voluntary for most corporate issuers.[48]

Prospects

Sustainable finance is a concept that is transforming approaches to capital allocation and risk management. It rests on ESG principles and encompasses climate, green, social, nature, and transition finance. Although the sustainable finance market continues to expand, most of its activity remains concentrated in just three regions, whereas regulation is developing almost everywhere, albeit at varying intensity. Despite the persistent fragmentation of regulatory models at the regional and national levels — in particular, in the degree to which regulatory requirements are mandatory and the extent of state intervention — there is a discernible trend towards the gradual convergence of certain elements of the system. The most notable progress has been made in disclosure, owing to the spread of international ISSB standards, the development of national taxonomies, and efforts to improve their compatibility, principally under the CGT and the IPSF.

In the medium term, key directions for the development of regulatory systems will include the further harmonization of national disclosure standards with international requirements and the gradual convergence of sustainable-activity classifications within regions and groups of countries. Given the dynamic growth of the market in large emerging economies, the use of transition taxonomies is expected to expand, particularly in countries with a pressing need for mechanisms to finance hard-to-abate industries. In addition, the active development of sovereign programmes for biodiversity conservation and land-degradation prevention, together with methodological approaches to natural capital valuation, will provide a powerful impetus for scaling up nature finance instruments — a matter of critical importance for developing markets.

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sustainability disclosure for public companies and has adopted national reporting standards aligned with the ISSB standards (IFRS S1 and IFRS S2). URL

[46] The methodology focuses on green, transition, and social projects. Decree of the Government of the Russian Federation No. 1587 of 21 September 2021. URL

[47] Bank of Russia Instruction No. 220-I of 26 May 2025, “On Mandatory Ratios and Capital Adequacy Buffers for Banks with a Universal Licence and on the Bank of Russia’s Supervision of Compliance Therewith”. URL

[48] Bank of Russia Ordinance No. 5959-U of 1 October 2021, “On Amendments to Bank of Russia Regulation No. 706-P of 19 December 2019 on Securities Issuance Standards” (registered with the Russian Ministry of Justice on 8 November 2021, No. 65721). URL