Climate Finance Policy Unit
Monetary and Capital Markets

Climate Finance Monitor

WEDNESDAY, FEBRUARY 1, 2023

CLIMATE FINANCE MONITOR HIGHLIGHTS

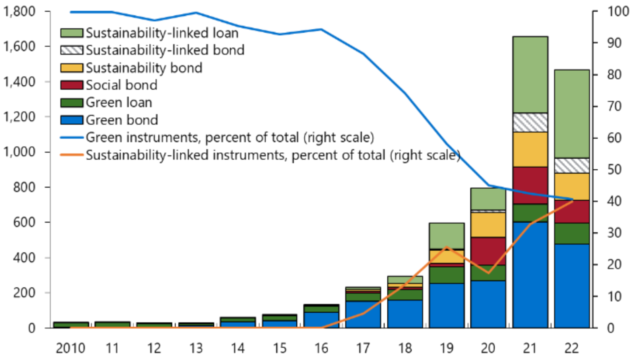
- **After registering record-high growth in 2021, global sustainable debt issuance declined by 11 per cent in 2022 amid deteriorating macrofinancial conditions**.
  – Notwithstanding, sustainability-linked issuance increased in 2022, driven by sustainability-linked loans, hereby resulting in an increased share, confirming deep-seated market trends in transition finance.
  – Momentum for social bond issuance, however, was widely subdued, despite increasing financing needs for just transition purposes.
  – Issuance by emerging markets and developing economies (EMDEs) showed resilience in 2022. The predominance of green bonds is increasingly rivaled by other debt instruments, demonstrating the more pressing need to finance EMDE transitional assets.
- **ESG fund flows (equity and debt) have shown resilience in spite of large 2022 market sell-off**, with green bonds and equities however underperforming compared to peers throughout the year.
- **COP27 has reaffirmed the urgent need to phase out fossil fuels, while the upward trends in such financing (including for expansion purposes) and in methane emissions, have continued**. Addressing the mismatch between climate-related financing needs and supply is a critical policy priority.

This Monitor was prepared by Charlotte Gardes-Landolfini, Deepali Gautam, Esti Kemp, and Yanzhe Xiao (MCM Department).
The authors would like to thank Michael König (IPCC) for providing data and sharing views on the financing gap (page 10).

Global Sustainable Debt Issuance Decreased for the First Time on Record Ever in 2022, Despite Some Signs of Momentum and Diversification Across Instruments

After a record high in 2021, sustainable debt issuance decreased in 2022.

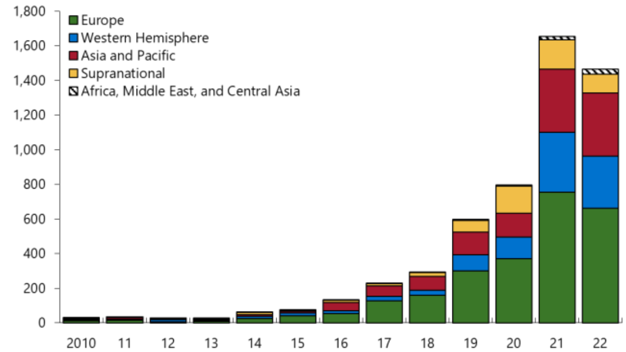
1. Global Sustainable Debt Issuance by Instrument
(Billions of U.S. dollars; as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

There was an analogous regional distribution and distinctive roles played by China and the United States.

2. Global Sustainable Debt Issuance by Region
(Billions of U.S. dollars; as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

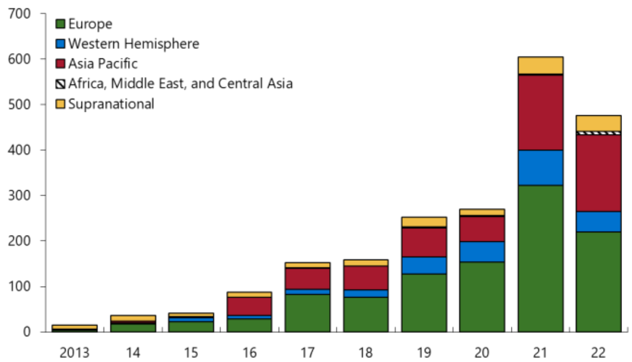
- In a year marked by the war in Ukraine and the subsequent energy crisis that spurred global headline inflation, **2022 sustainable debt issuance recorded its first annual year-on-year decline of 11 percent**.
- Amid higher interest rates and heigtened volatility, total global issuance decreased from US$1.7 trillion in 2021, to US$1.5 trillion in 2022.
- **The share of green instruments and social bonds decreased while sustainability-linked instruments increased** from 33 in 2021- to 40 percent in 2022.
- It confirms deep-seated market trends in transition finance. Issuers increasingly use **outcome-based instruments** to signal their transition pathways (sustainability-linked bonds being one of the fastest-growing asset classes, and sustainability-linked loans).
- The ongoing development of frameworks for transition finance aim at strengthening the integrity and pave the way for scale up of these instruments The G20 Sustainable Finance Working Group (SFWG) developed a set of high-level principles on transition finance including on the identification and reporting of transitional activities and investments.

- **Advanced markets continue to play a major role with the largest share of sustainable debt issuance in 2022**. While Europe remains the most dynamic market, its share in the total issuance remained stable as 45 percent in 2022. The share of the Asia-Pacific region increased to 25 percent, recording an increase of 3 percentage points. Relative issuance stability in the Western Hemisphere in 2022 was driven by the United States, where issuance amounted to a US$226 billion and a high deal count.
- In the Asia-Pacific region, **China and Japan were the largest sustainable debt issuers**, largely because of increased issuer appetite and policy measures to support market growth. China has been the most important issuer in the region by volume, and number of issuers, as it set sights on its climate-related targets (IEA, 2021). The steepness of the adjustment path, the higher decarbonization costs due to backloading and the need to increase GHG emissions reduction in China (IMF, 2022) is reflected in the vast expansion of the sustainable bond market in 2022, despite slower global trends.

The Green Bond Market Has Declined in 2022, with Europe and China Leading the Way

Europe still leads green bond issuance, while China's bond market boomed in 2022.

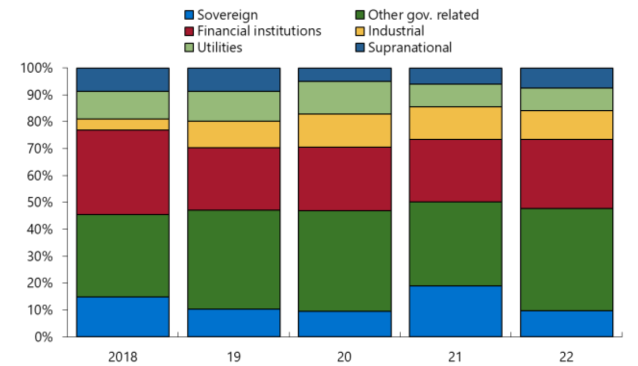
3. Global Green Bond Issuance by Region
(Billions of U.S. dollars; as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

Share of green bond issuances remained broadly steady across industries, with sovereigns leading the way.

4. Global Green Bond Issuance Industry Breakdown[i]
(In percent, as of December 31, 2022)



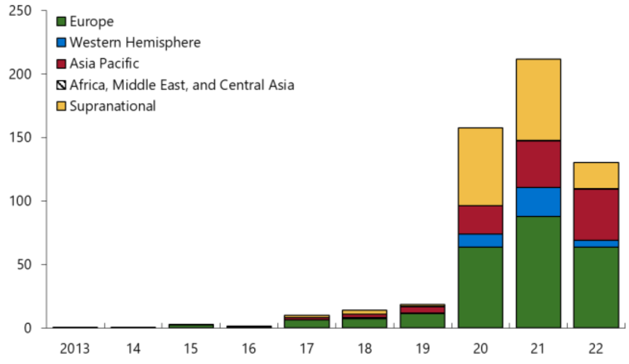
Source: Bloomberg Finance L.P. and IMF staff calculations.

- **Green bond issuance followed a downward trend in 2022 across all regions other than Asia**. Despite the loss of momentum, Europe remains the largest issuer, representing about half of the green bond supply.
- **The Asia-Pacific region has registered the greatest annual share growth (8 percent) and China accounts for the lion's share (67 percent) of Asia-Pacific green bond issuance**. The Chinese Regulatory Securities Commission recently updated its Green Bond Principles (*i.e.,* 100 percent of funds to be used for green projects, independent ex-ante certification, and ex-post assessment reporting during the bond's life).
- **Sovereign green bond issuance has increased considerably since the onset of the pandemic, and kept the momentum since,** despite a late entry of sovereigns into the market (BIS, 2022). Sovereign bonds tend to have the longest maturities within the green bond universe, with average maturity about 13 years for sovereign green bond compared to 8 years for non-sovereign green bonds.
- **Germany, Italy, and France are the top sovereign bond issuers.** Denmark priced its debut sovereign green bond in early 2022, while Hong Kong SAR, Indonesia, and Hungary returned to the market with new issuances.

The Momentum for Social Bond Issuance Has Declined since Mid-2021, with Government-Backed Issuance Remaining a Strong Share

Social bond issuance decreased sharply, despite rising funding needs for social and just transition programs.

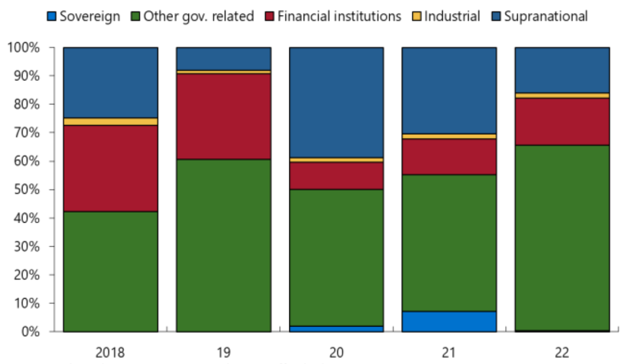
5. Global Social Bonds Issuance by Region
(Billions of U.S. dollars as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

Governments persisted with support and supplied most social bonds in 2022.

6. Global Social Bond Issuance Industry Breakdown
(In percent, as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

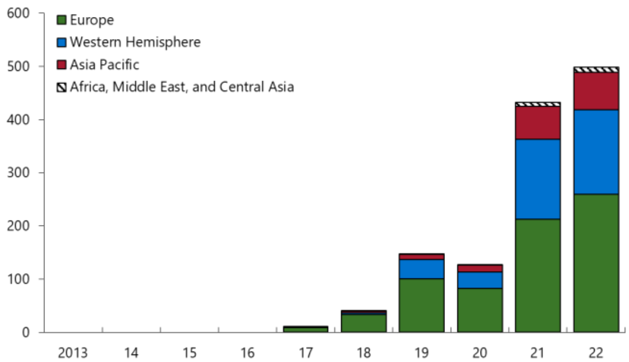
- As the world slowly moved past the pandemic in 2022, **social bond issuance dropped by about 38 percent** globally, after reaching a record high of US$212 billion in 2021.
- This largely reflected a a drop in issuance in Europe and Western Hemisphere. Top social bond issuers in 2022 included the French *Caisse d'Amortissement de la Dette Sociale* that completed a mid- and long-term program totaling about US$40.5 billion, and the Asian Development Bank. The United States counted the largest number of issuers, driven by local governments (sale of social bonds by New York City, and UN PRI, 2021).
- The role of government-related and sovereign issuance remains predominant (66 percent in total), with supranationals and financial institutions lagging with similar shares, around 15 percent.
- The International Labor Organization contributed to the work of the G20 SFWG with a report dedicated to the financing of the just transition emphasizing the role of private financial institutions to invest in local social bond issuance programs. The COP27 agreement (title VIII) also stated the crucial nature of a just transition.

Positive Outcomes for Sustainability-Linked Loan Issuance in 2022 Reflected an Interest in Transition Finance Instruments Extending to the Banking Space

Sustainability-linked loan issuances saw the strongest sustained momentum in 2022.

7. Global Sustainability-linked Loan Issuance by Region

(Billions of U.S. dollars as of December 31, 2022)

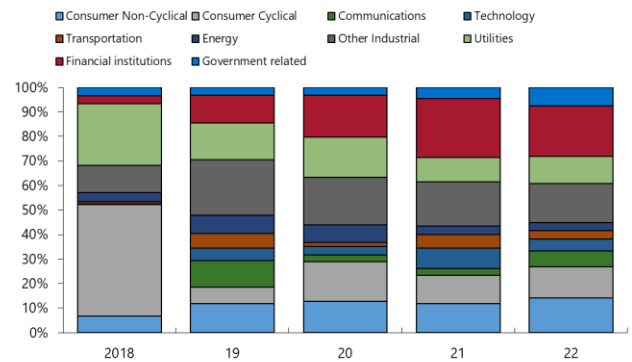


Source: Bloomberg Finance L.P. and IMF staff calculations.

Further diversification of sustainability-linked loan supply in 2022 with higher shares of financials and tech.

8. Global Sustainability-linked Loan Issuance Industry Breakdown[ii]

(In percent, as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

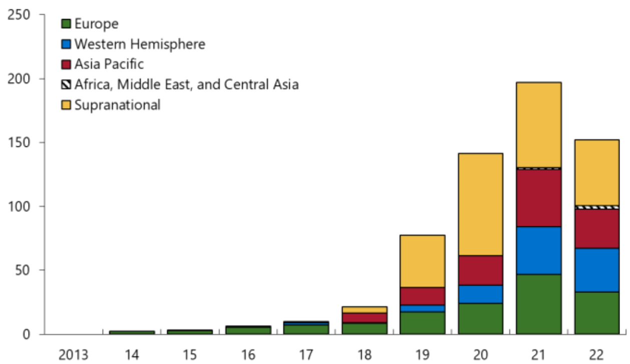
- The annual growth rate for sustainability-linked loans (SLLs) increased by about 15.5 percent in 2022 compared to 2021. SLL issuance has shown sustained impetus, which illustrates the **rapidly evolving role of bank loans** (as the primary source of corporate debt financing) **in the sustainability financing space**.
- Europe still accounts for the largest share of issuance (52 percent), with a 22 percent growth in 2022 compared to that in 2021.

- Sustainability-linked loan issuances continued to be **well-spread across industries** in 2022, while the share of financial institutions dropped slightly to 20 percent.
- **These issuances enable borrowers to signal credibility of their commitments to financiers**. While standards for SLLs have currently been market-based (ICMA, LMA), the G20 SFWG has published a principle for transition finance development. It focuses on general corporate purpose instruments (*e.g.,* SLLs), recommending the disclosure of the performance of key performance indicators and sustainability performance targets that are material to the issuer's activities.

Investor Interest in Sustainability Bonds, Largely Maintained by Governments, Illustrates the Multidimensional Nature of Climate Finance

Sustainable debt issuance decreased significantly in 2022, only slightly exceeding its 2020 level.

9. Global Sustainability Bond Issuance by Region
(Billions of U.S. dollars as of December 31, 2022)

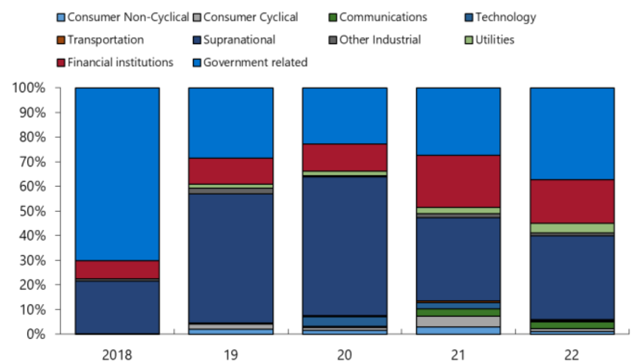


Source: Bloomberg Finance L.P. and IMF staff calculations.

- Despite the downward trend started in the third quarter of 2022, **sustainability bond issuance slightly rebounded.** While Europe's share slightly dropped from 24 percent to 22 percent, the Western Hemisphere's and the supranationals' (IBRD, IDA, AIIB) increased in 2022.
- Worth noting is the increasing role played by **sustainability Islamic bonds *sukuks***, from sovereign and private issuers, and sustainability-related *sukuk* issuances led by the Islamic Development Bank, Indonesia, and Malaysia in 2021 (IFSB, 2022, section 1.3.1.1).

Governments represent the most significant share of sustainability bond issuance over 2022.

10. Global Sustainability Bond Issuance Industry Breakdown
(In percent. as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

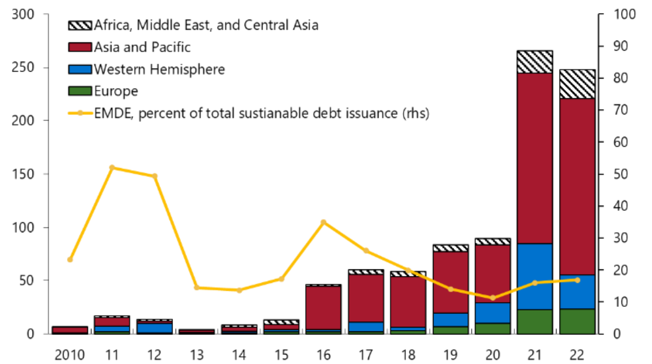
- Governments (37 percent), supranationals (34 percent), and financials (18 percent) continued to supply the bulk of sustainability bonds in 2022. A few EM countries have contributed to the segment's growing volumes, notably Chile (US$5 billion), and debut sustainability bonds issued by the Philippines (US$1 billion) and Mexico (US$1.25 billion).
- The largest single deal in 2022 has been the AUD-denominated sustainability bond issued by the World Bank, amounting to US$7.2 billion. Overall, multilateral development banks have been leading issuers in this segment.

Sustainable Debt Issuance in Emerging Markets and Developing Economies (EMDEs) Also Eased in Annual Growth Terms in 2022

Sustainable debt issuance in EMDEs lost some momentum in 2022, similar to global trends.

11. EMDE Sustainable Debt Issuance by Region

(Billions of U.S. dollars; percent; as of December 31, 2022)

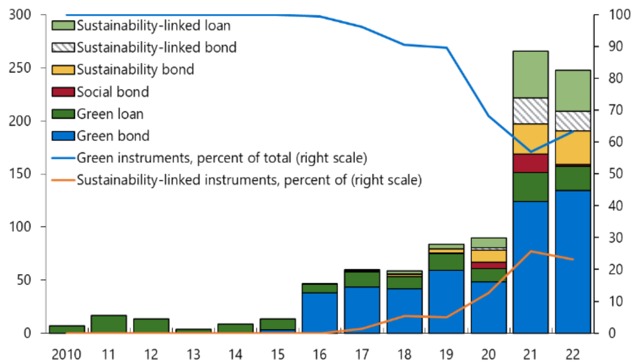


Source: Bloomberg Finance L.P. and IMF staff calculations.

Green bonds remain the largest segment, although the proportion of non-green bonds has increased over time.

12. EMDE Sustainable Debt Issuance by Instrument

(Billions of U.S. dollars; percent; as of December 31, 2022)



Source: Bloomberg Finance L.P. and IMF staff calculations.

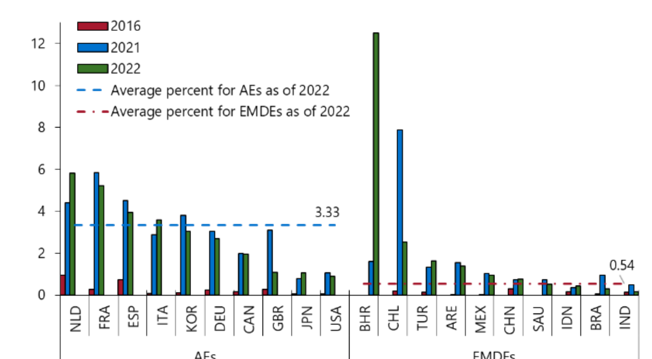
- The share of EMDEs in the total sustainable bond issuance was little changed between 2021 and 2022 at around 16 percent. **EMDE sustainable debt issuance varies across regions in 2022**. The Asia-Pacific region has dominated (67 percent) share ([World Bank, 2022](#)), while growth has been distinct across regions (decline by 49 percent in the Western Hemisphere).

- **Green bonds are still the main instrument in the ecosystem (54 percent)**, but other debt instruments have gained prominence since 2018, especially outside of China, demonstrating the need to finance transitional assets. Amidst tightened macrofinancial conditions and heightened scrutiny [due to litigation risks](#), sustainability-linked bonds (SLBs) have faced a marked slowdown of 25 percent.

Despite recent increases, EMDE sustainable debt issuance remains limited compared to that of AEs.

13. Sustainable Debt Issuance in percent of GDP

(Percent)

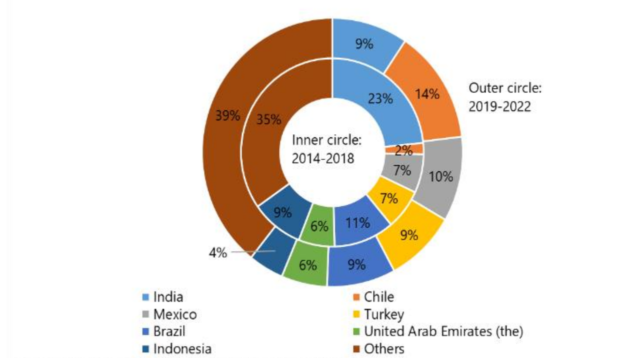


Source: Bloomberg Finance L.P., World Economic Outlook, and IMF staff calculations.

Country market shares have known a substantial shift over the years.

14. Composition of EMDEs' (excl. China) Sustainable Debt Issuance

(Percent)



Source: Bloomberg Finance L.P. and IMF staff calculations.

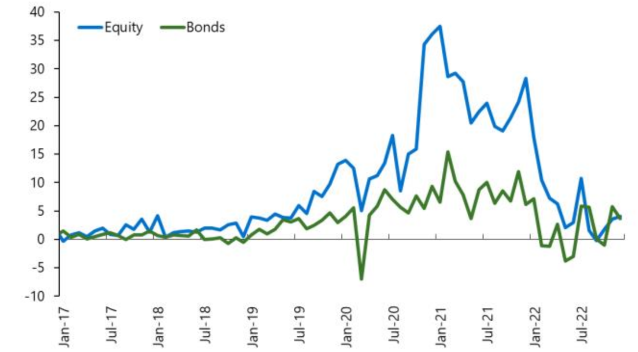
- Issuance of sustainable debt in EMDEs remained a small share of their GDP and lower than that of AEs. In 2022, half of EMDE issuers saw their sustainable debt-to-GDP ratio shrink, reflecting tightening monetary policy and the resultant higher funding costs, while for the others, growth has been much slower compared to that in 2021.

- There has been a shift in market shares in terms of sustainable debt issuance amongst EMDEs (except China) over the years. Chile and Turkey have gained in proportion over the last three years.

ESG Fund Flows Have Shown Resilience Amid 2022 Market Sell-off

Net ESG fund flows in 2022 bucked a year-long downtrend, and a brutal Q2 2022.

15. Equity and Bond Flows into ESG/SRI Funds
(Billions of U.S. dollar as of December 31, 2022)

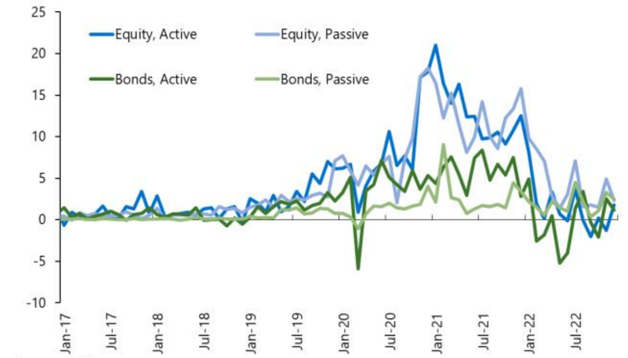


Source: EPFR.

- Despite concerns over inflationary pressures and rising interest rates, ESG/SRI fund flows showed resilience in 2022 (compared to the broader market that experienced net outflows), with US$89 billion of net inflows.
- Overall ESG/SRI fund inflows in 2022 fell by 78 percent from US$405 billion of inflows in 2021, in the context of fund relabeling developments in Europe, stricter standards in Asia, and debates on the definition of "ESG" in the United States.

The vast majority of net inflows has been seen in passive funds.

16. Equity and Bond Flows into ESG/SRI Funds
(Billions of U.S. dollar as of December 31, 2022)



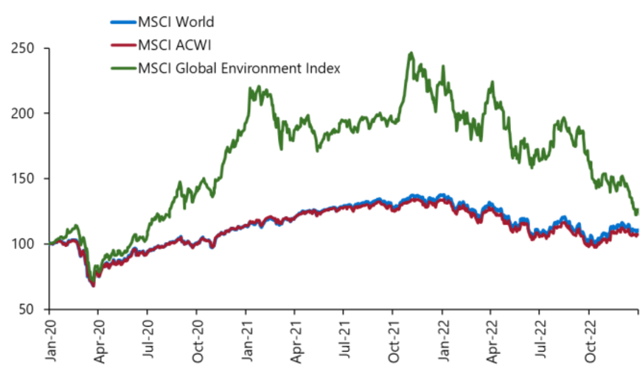
Source: EPFR.

- Net inflows into passive equity and bond funds amounted to roughly US$75 billion in 2022.
- As regards to actively managed bond funds, after US$8 billion net outflows in the first half of 2022, they bounced back into net inflows territory from July of US$6 billion up to end of 2022.

Green Equities and Green Bonds Underperformed in 2022

Environmentally beneficial equities underperformed global peers in 2022.

17. MSCI Global Environment Index and Various Global Equity Indices
(Normalized to 100 as of December 31, 2019)

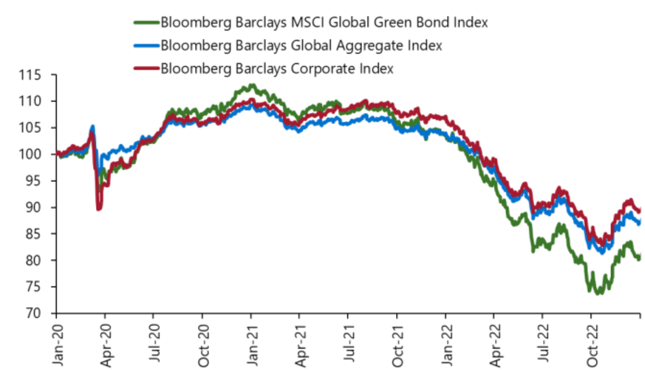


Source: Bloomberg Finance L.P. and IMF staff calculations.

- **After strong performance since 2020, green equities' performance decreased throughout most of 2022** and ended the year with about a 50 percent decline, which was lower than 20 percent decline in MSCI World index.

Green bonds also underperforming in most of 2022, reflecting composition differences between bond types.

18. Bloomberg Barclays MSCI Global Green Bond Index and Various Fixed Income Indices
(Normalized to 100 as of December 31, 2019)



Source: Bloomberg Finance L.P. and IMF staff calculations.

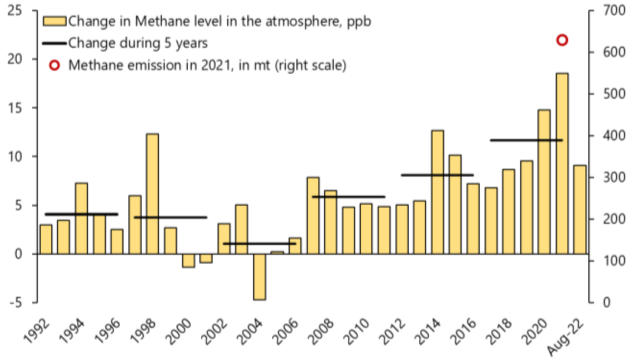
- The difference between green and non-green bond performance throughout 2022 may be driven by changes in long government bond yields and credit spreads, as well as geographical differences depending upon the prominent role of sustainable finance across the world.

THE COP27 ON CLIMATE CHANGE IN PERSPECTIVE

While reiterating the need to pursue efforts to limit the temperature increase to 1.5 °C, the Sharm el-Sheikh Implementation Plan does not fully address the issue of fossil fuel phase out.

Methane levels have increased at the fastest space over the past five years.

19. Change in Methane Levels in Atmosphere
(Parts per billion, mt)

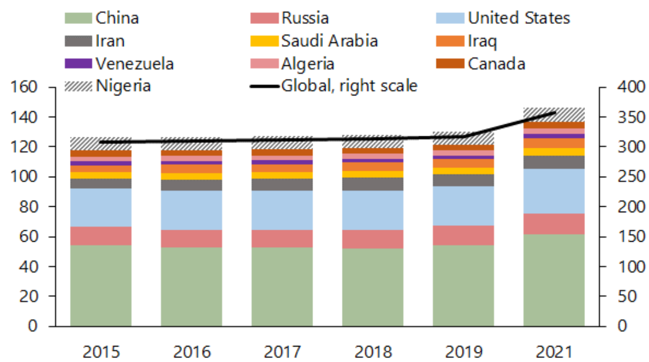


Source: Lan, X., K.W. Thoning, and E.J. Dlugokencky (2023) and IMF staff caluclations.

- In 2017-21, **methane levels increased at the fastest pace since the early 1990s**. It is worrisome given methane's high global warming potential. Following the Global Methane Pledge (2021), the COP27 agreement reiterates the necessity of further actions to reduce these emissions by 2030.

Top 10 fossil fuel producer countries accounting for a steady share of 40 percent of emissions since 2015.

20. Methane Emission by Top Oil and Gas producer country, 2021
(Mt)

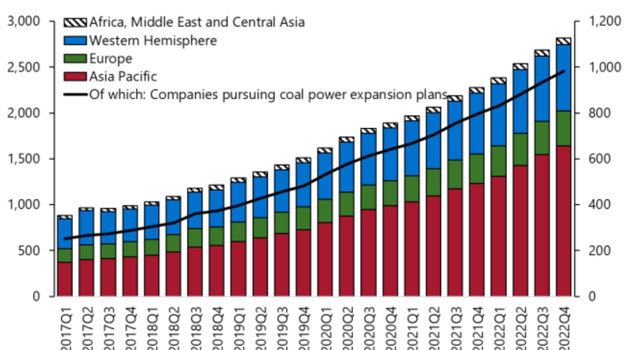


Source: PRIMAP-hist, IEA, and IMF staff calculations. (derived)

- The positive correlation between fossil fuel extraction/combustion and methane emissions in top producing countries justifies abatement measures at no net cost (IEA, 2022), while detection and measurement technologies are becoming increasingly available (IMF, 2022).

In this context, financing of thermal coal capacity has increased substantially since the Paris Agreement.

21. Total Debt of Companies with a Significant Role in Thermal Coal Value Chain (EMDEs and AEs)
(Billions of U.S. dollars)

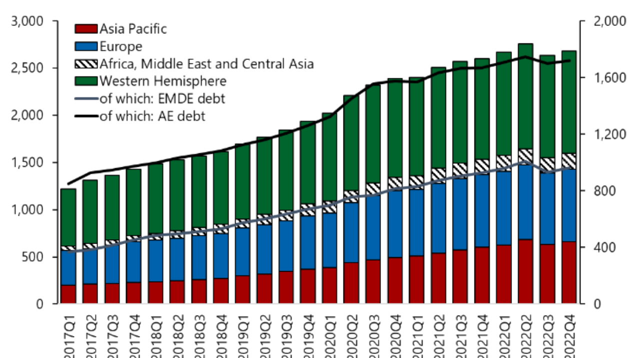


Source: Bloomberg Finance L.P., Urgewald, and IMF staff calculations.

- Outstanding debt of EMDE-based companies with coal power expansion plans increased by about 350 percent since 2016, revealing deep-seated trends conflicting with a net-zero scenario (IEA, 2022). Title IV of the COP27 agreement underlines to "phasedown […] *unabated* coal power", while transitioning from *all* fossil fuels is a repeated requirement set by the IPCC (2022) not to overshoot Paris targets.

Oil and gas financing has also shown upward trends in EMDEs and AEs alike.

22. Total Debt of Companies in the Oil and Gas Industry (EMDEs and AEs)
(Billions of U.S. dollars)



Source: Bloomberg Finance L.P., Urgewald, and IMF staff calculations.

- The ability to raise debt financing keeps increasing in the oil and gas sector, with a larger than 400 percent increase in the Asia-Pacific region since the Paris Agreement (primarily via bank loans). It occurred despite caution that an achievement of net-zero emission targets requires halting *new* oil and gas field development (IEA, 2021).

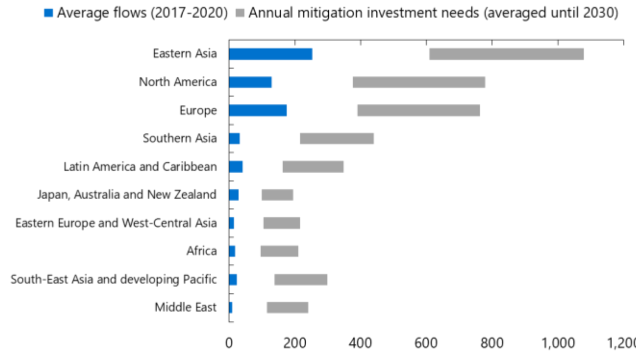
THE COP27 ON CLIMATE CHANGE IN PERSPECTIVE

Scaling up private climate finance while increasing the key role of multilateral development banks and international financial institutions is a first in a COP agreement

Overall gap for mitigation finance is large and deep-seated across all regions of the globe.

23. Breakdown of Mitigation Average Investment Flows and Needs until 2030

(Billions of 2015 U.S. dollars per annum)

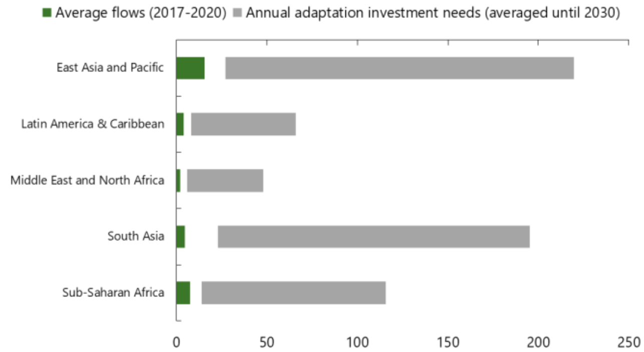


Source: Kreibiehl, Silvie; König, Michael; Moon, Jongwoo (2022).

The gap is greater for adaptation purposes, particularly in EMDEs where vulnerabilities are building up.

24. Breakdown of Adaptation Average Investment Flows and Needs until 2030

(Billions of U.S. dollars per annum)



Source: Climate Policy Initiative (2020, 2022), UNEP (2022), and IMF staff calculations.

Note: In figure 24, The climate flows include both EMDEs and advanced economies in selected regions; the needs are calculated for developing countries only.

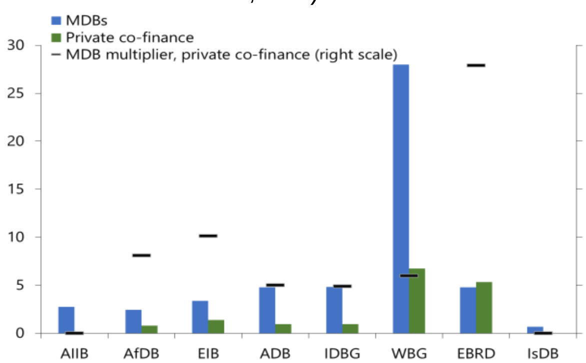
- The COP27 agreement (title IX) recalls that US$4 trillion per year for renewable energy is needed up until 2030, and at least US$4 to US$6 trillion per year for a global transformation of the energy system. This mismatch is challenging to address given the structure of climate finance markets, largely dominated by debt, when renewable energy infrastructure requires equity finance (IMF, 2022).

- Adaptation has played a key role in the COP27 negotiations (see titles V and VI).
- It faces large hurdles, as a result of difficult tracking, underpriced risks, and a lack of economies of scale, with most financing is currently provided by the public sector.

MDBs crowd in private finance on average of only about one third the resources they commit themselves.

25. MDB Climate Finance from Their Own Resources and Private Investors (Private Finance) for EMDE, 2021

(Billions of U.S. dollars; ratio)

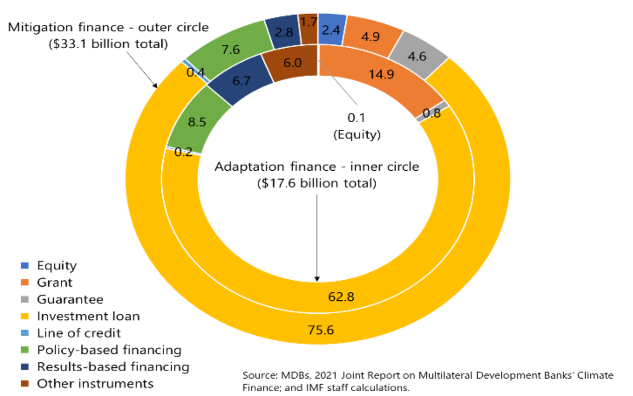


Source: MDBs, 2021 Joint Report on Multilateral Development Banks' Climate Finance; and IMF staff calculations.

This is in part because they invest a small share (1.6 percent) in equity instruments or guarantees in EMDEs.

26. EMDE Use of Instruments: Total Commitments of MDBs' Own Resources, 2021

(Percent)



Source: MDBs, 2021 Joint Report on Multilateral Development Banks' Climate Finance; and IMF staff calculations.

Note: Commitments include the nominal value of guarantees, which may or may not lead to use of a multilateral development bank's own resources. ADB = Asian Development Bank; AfDB = African Development Bank; AIIB = Asian Infrastructure Investment Bank; EBRD = European Bank for Reconstruction and Development; EIB = European Investment Bank; IDBG = Inter-American Development Bank Group; IsDB = Islamic Development Bank; MDB = multilateral development bank; WBG = World Bank Group.

- The need to leverage the resources of MDBs most efficiently for climate finance has been reiterated during COP27. Solutions include the greater use of equity to maximize co-financing, and the expansion of their own resources.

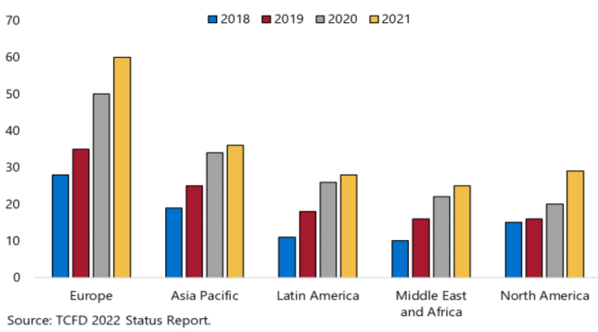
- Title IX of the COP27 agreement calls for MDBs to use the breadth of their policy and financial instruments for greater results, including on private capital mobilization (IMF, 2022).

Climate-Related Disclosures have Continued to Improve in 2022, but Show Lasting Discrepancies in Quality and Consistency, Which Justify Global Policy Focus

Although key milestones have been achieved since the publication of the Task Force on Climate-related Financial Disclosures (TCFD) recommendations in 2017, only a marginal number (4%) of companies disclose in line with all, and substantial geographical discrepancies remain. Methodological challenges relate to the conduct of scenario analysis, the estimation of scope 3 GHG emissions, and the development of processes to assess and manage climate-related risks in order to integrate them into existing risk management processes. In this context, policy priorities at global level include **interoperability** between the common baseline and jurisdiction-specific requirements; **greater reliability** of climate-related corporate disclosures, and **reinforcing the uptake in EMDEs** (IMF, 2022).

While Europe remains the leading region, disclosure of climate metrics and targets has increased across all regions since 2017.

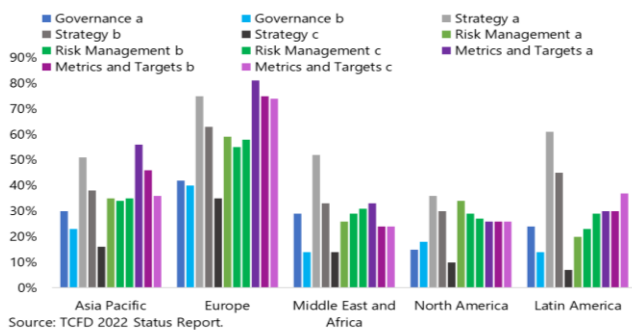
27. TCFD-Aligned Overall Reporting by Region[iii]
(Average percentage of companies that disclose information aligned with TCFD recommended disclosures; 2022)



Source: TCFD 2022 Status Report.

There continues to be significant variation across the 11 reporting recommendations, with governance and the description of the resilience of a company's strategy (c) remain the lowest reported disclosures overall slagging.

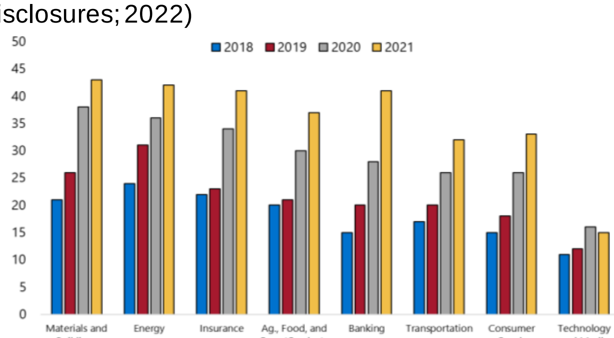
28. TCFD-Aligned Metrics and Targets Disclosures by Region
(Average percentage of companies that disclose Information aligned with TCFD recommended disclosures; 2022)



Source: TCFD 2022 Status Report.

Materials and energy have the highest disclosures among all industries, closely followed by the banking sector that saw the most significant improvement in 2021.

29. TCFD-Aligned Metrics and Targets Overall Reporting by Industry [iv]
(Average percentage of companies that disclose Information aligned with TCFD recommended disclosures; 2022)



Source: TCFD 2022 Status Report.

Diversification is also visible across sectors' reporting of the disclosures, with banking and insurance the leading sectors for risk management.

30. TCFD-Aligned Metrics and Targets Disclosures by Industry
(Average percentage of companies That disclose Information aligned with TCFD recommended disclosures; 2022)

Source: TCFD 2022 Status Report.

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[i] "Sovereign" includes bonds issued by central governments, "Other gov. related" includes bonds issued by agencies and local authorities, as well as covered bonds.
[ii] "Government related" includes bonds issued by central governments, agencies, and local authorities, as well as covered bonds.
[iii] Note: In figure 28, "Governance a" represents board oversight; "Governance b" represents management's role; "Strategy a" represents risks and opportunities; "Strategy b" represents impact on organization; "Strategy c" represents resilience of strategy; "Risk Management a" represents risk ID and assessment processes; "Risk Management b" represents risk management processes; "Risk Management c" represents integration into overall risk management; "Metrics and Targets a" represents climate-related metrics; "Metrics and Targets b" represents scope 1, 2, 3 GHG emissions; "Metrics and Targets c" represents climate related targets (TCFD Status Report, 2022).
[iv] Note: M&B is Materials and Buildings, AFFP is Agriculture, Food, and Forest Products, CG is consumer goods, and T&M is Technology and Media. In figure 30, detailed information for legend abbreviation can be found in figure 28 note.