ALLEN & OVERY

CLIMATE POLICY INITIATIVE

Annex

How big is the Net Zero financing gap?

September 2023

Glossary of terms

Climate finance:

primary capital flows to low-carbon and climate-resilient infrastructure that serves (either directly or indirectly) to reduce greenhouse gas (GHG) emissions or to adapt to the effects of climate change.

Net Zero:

the point at which man-made GHG emissions are balanced globally with CO2 removals over a specific period.

Paris Agreement:

a legally binding treaty on climate change adopted at COP 21 in Paris in 2015, with a goal of holding "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursuing efforts to "limit the temperature increase to 1.5°C above pre-industrial levels."[4]

Sector:

our analysis covers investments into various sectors and technologies. "Sectors" covers energy systems; industry, waste, water and wastewater; buildings and infrastructure; [5] transport; agriculture, forestry and other land uses; and fisheries.

Technology:

a subset of a sector, for example wind energy (a subset of energy systems) or EV chargers (a subset of transport).

Methodology

For this report we used a definition of climate finance aligned with the United Nations Framework Convention on Climate Change (UNFCCC) Standing Committee on Finance, which states: "Climate finance aims at reducing emissions and enhancing sinks of GHGs and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts." [129]

Our climate finance mapping exercise is limited to primary capital flows directed toward low-carbon and climate-resilient development interventions with direct or indirect GHG mitigation or adaptation benefits. Our taxonomy of climate finance is based on international best practices, including from MDBs, the Climate Bonds Initiative, the UN Intergovernmental Panel on Climate Change (IPCC), and the EU sustainable finance taxonomy.

Climate finance data collection [130]

We use project-level data where available, and cross-check our figures for consistency in relation to actors, geographies, instruments, and sectors. Desk research complements this cleaning process where the datasets are incomplete. We observe the following general principles when collecting and reporting the data:

1. Avoid double counting

We track only those transactions that represent new money targeting climate-specific outcomes. For example, both private R&D for new technologies and investment in manufacturing for low-emissions and climate-resilient development are excluded. This is because at the technology deployment stage, such costs are capitalized and factored into the investment amounts of new projects that implement these technologies, increasing the risk of double counting if the initial investment was to be tracked separately.

Similarly, revenue support mechanisms such as feed-in tariffs reimburse the initial investment costs, so including them would constitute double counting. Thus, we do not track policy-induced revenue support mechanisms or other public subsidies whose primary function is to pay back initial investment costs.

Where there is overlap between datasets, we select only the highest quality entry in terms of reliability and comprehensiveness for each transaction.

2. Track primary investment

We capture total primary financial transactions and investment costs or, where tracked, components of activities that directly contribute to adaptation and/or mitigation, plus public framework and capacity development expenditures (eg development of national climate strategies). Secondary market transactions (eg re-selling of stakes or public trading on financial markets) are not tracked because they do not represent new investment targeting climate-specific outcomes, but rather money being exchanged for existing assets.

3. Exclude carbon emissions lock-in

Investments and expenditures in our dataset do not capture investments that have a high risk of locking in significant future GHG emissions. Based on this principle, fossil fuel-based lower-carbon and energy-efficient generation transactions, such as financing for efficiency retrofits of coal-fired power plants, are excluded.

4. Maximize granularity

Wherever possible, we use project-level data to check and select flows. Project-level information is more likely to provide verifiable details on project characteristics, instruments, destinations of financing and financing structures. Where project-level data is not available or insufficiently complete, aggregated data is used.

5. Include tangible financial commitments

We study financial commitments made during the period being tracked. Depending on the context (eg a public commitment by a government, versus a private financing contract agreed between corporate actors), commitments may refer to firm obligations by means of board decisions on investment programs, closure of financing contracts or similar actions.

Although the focus on commitments rather than disbursements may affect the sequencing of flows over time – given that committed amounts are often disbursed over a number of years – disbursement information would provide a more accurate picture of the actual volume of financial resources devoted to addressing climate change in a given year. However, consistent data on disbursements is often lacking across various actors.

6. Err toward conservativeness

Where we have insufficient details, we take a conservative approach and prefer to under-report rather than over-report climate finance. A case in point is energy efficiency investment from the private sector. Due to methodological differences regarding how energy efficiency components, often part of a larger project, are estimated in external sources using top down approaches (IEA, 2021), these investments are not included in this report.

This focus on conservativeness, and a general lack of publicly available data, results in data gaps. These include flows from domestic government budgets, from private companies in certain sectors such as land use and industry, and in sectors such as energy efficiency where metrics and definitions are non-standardized and disclosure and transparency on finance flows are limited.

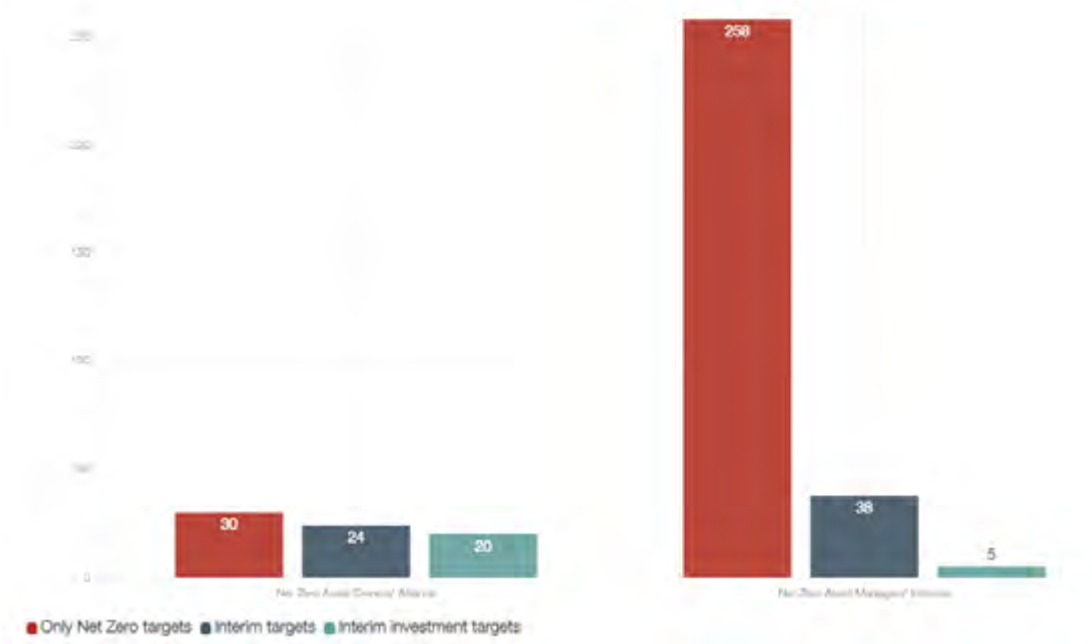
Climate finance needs assessment

We built our assessment of climate finance needs based on the best publicly available resources that are comparable to current climate finance flows. These figures are based on projected emissions pathways to achieve Net Zero by 2050 with their upper and lower bounds reflecting the variance over time in technological development, adoption rates and cost (the figures are also subject to change in the future in response to external shocks such as pandemics, war, and inflation, among other things). We do not apply additional assumptions to third-party scenarios.

These reports provide annual investment needs for different sectors and technologies based on projected technology costs, technology developments and breakthroughs, and land availability, and the need for relatively more expensive solutions such as nuclear, floating offshore wind, and carbon removal for certain countries and sectors.

For reports that are updated regularly, we have only used the most recent publication. As more literature and knowledge build up, and depending on the course of economic development (eg high inflation environment) and climate investment decisions made in the future, our climate needs assessment may change.

Institutional targets among Net Zero Alliances (No. of members with interim targets vs investment targets)



Source: Climate Policy Initiative

Table A.1: Literature review on climate finance needs assessment

Reference	Scope/coverage
Bloomberg New Energy Finance (BNEF), 2022. New Energy Outlook 2022.	Renewable power, Power Transmission & Distribution, CCUS, Integration solutions (Hydrogen, Pumped Hydro, Storage)
Bloomberg New Energy Finance (BNEF), 2022. Electric Vehicle Outlook 2022.	Battery EVs
International Energy Agency (IEA), 2020. Global EV Outlook 2020.	Battery EVs
International Energy Agency (IEA), 2019. The Future of Rail.	Rail transport
International Energy Agency (IEA), 2021. Net Zero by 2050 A Roadmap for the Global Energy Sector.	Renewable power, Power T&D, Biofuels, CCUS, Integration solutions, Transport, Industry, Buildings, Distributed Renewables
International Energy Agency (IEA), 2020. Outlook for biogas and biomethane.	Biofuels
International Renewable Energy Agency (IRENA), 2022. World Energy Transition Outlook. Abu Dhabi.	Renewable power, Power T&D, Biofuels, CCUS, Integration solutions, Transport, Industry, Buildings, Distributed Renewables
United Nations Environment Program (UNEP), World Economic Forum (WEF), and The Economics of Land Degradation (ELD), 2021. State of Finance for Nature.	Re/Afforestation, Silvopasture, Mangrove and Peatland restoration
United Nations Environment Program (UNEP), 2018. "The Adaptation Gap Report 2018." Nairobi.	Adaptation
Harmsen, J. H. M., D. P. van Vuuren, D. R. Nayak, A. F. Hof, L. Höglund-Isaksson, P. L. Lucas, J. B. Nielsen, P. Smith, and E. Stehfest. 2019. Long-term marginal abatement cost curves of non-CO2 greenhouse gases.	Methane abatement
Kreibiehl, Silvie; König, Michael; Moon, Jongwoo (2022): Data for Figure TS.25 – Technical Summary of the Working Group III Contribution to the IPCC Sixth Assessment Report. MetadataWorks, 04 April 2022. DOI: 10.48490/dw6j-ef56	Regional split of climate investment needs

Why is there such variation in our financing needs assessments?

The objective of assessing climate finance needs is to understand how much it would theoretically cost to limit global warming to a level compatible with the Paris Agreement. Because there are so many factors involved in projecting the response to climate change, every model takes a different approach on how to estimate Net Zero pathways.

Most scenarios concentrate on three emissions reduction pillars:

– behavioral and practice changes;

– efficiency and productivity gains; and

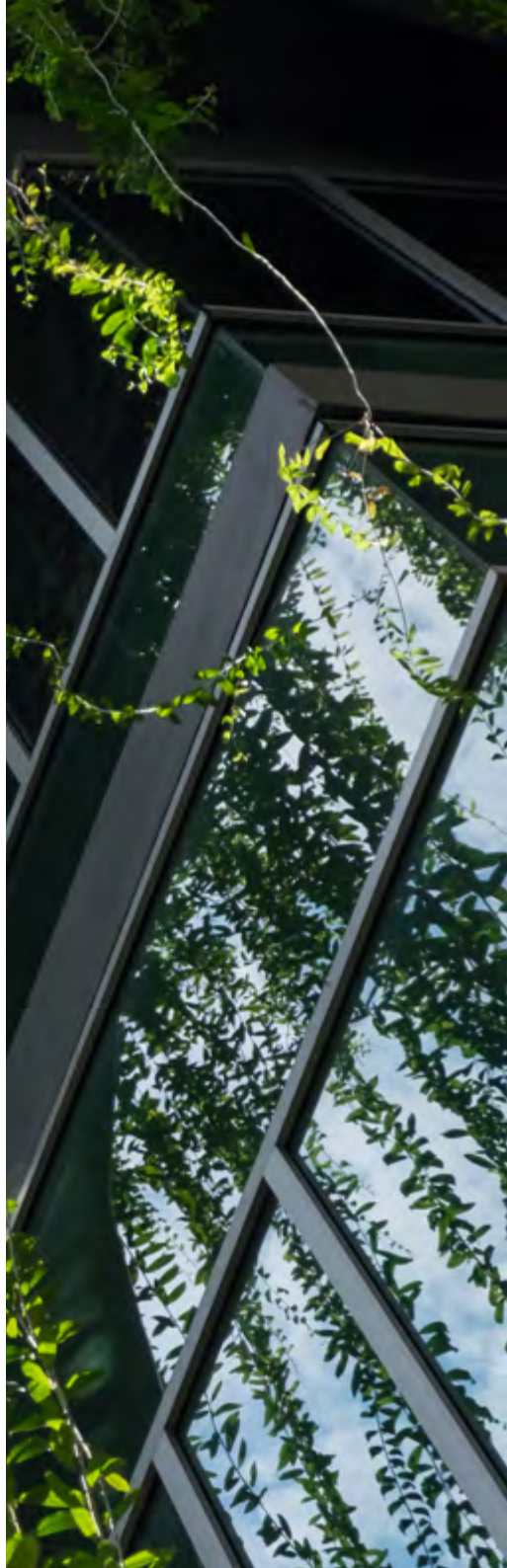
– low-carbon energy generation.

Depending on the weight attributed to each pillar, scenarios can have very different costs of implementation. For example, scenarios that rely on "technological bets" on less mature and more costly low-carbon technologies such as CCUS or green hydrogen can come with significantly greater implementation costs.

Some scenarios assume more significant cost declines in key technologies such as wind and solar while others exclude technologies such as nuclear and CCUS entirely, which causes cost estimates to increase.

To counter these difficulties, the models we use are consistent in their projection of which technologies will require the most investment in a modeled transition to a Net Zero economy – namely battery EVs, solar power, wind power, energy efficiency, and electricity transmission and distribution. By averaging the models' projections and incorporating sector-specific scenarios, we are able to capture the full range of differences.

Together these diverse visions, and their underlying methodological assumptions, can result in differences of trillions of dollars. However, all scenarios share a simple yet crucial concept: the longer we wait to take action, the higher the costs will be.



Regions and countries

This study adopts the regional breakdown from the 2022 Landscape of Climate Finance in Africa.[131]

Region	Country or territory
Central Asia & Eastern Europe	**OECD**: Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Turkey. **Non-OECD**: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Kazakhstan, Kosovo,[132] Kyrgyz Republic, North Macedonia, Montenegro, Republic of Moldova, Romania, Russian Federation, Serbia, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan
East Asia & Pacific	**Non-OECD**: American Samoa, Brunei, Cambodia, China, Cook Islands, Democratic People's Republic of Korea, Fiji, Indonesia, Kiribati, Lao PDR, Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Myanmar, Nauru, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, Vietnam
Latin America & Caribbean	**OECD**: Chile, Colombia, Costa Rica, Mexico **Non-OECD**: Anguilla, Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Bonaire, Brazil, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, St. Barthélemy, Sint Eustatius and Saba, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of), West Indies
Middle East	**Non-OECD**: Bahrain, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, United Arab Emirates, Yemen
Other Oceania	**OECD**: Australia **Non-OECD**: New Zealand, Tokelau

Region	Country or territory
Africa	**Non-OECD**: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Republic of Congo, Democratic Republic of the Congo, Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Morocco, Mozambique, Namibia, Niger, Nigeria, Réunion, Rwanda, São Tomé and Principe, Saint Helena, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, United Republic of Tanzania, Tunisia, Togo, Uganda, Zambia, Zimbabwe
South Asia	**Non-OECD**: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
US & Canada	**OECD: Canada**, United States of America
Western Europe	**OECD**: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom. Annex I Parties: Andorra, Liechtenstein, Malta, Monaco **Non-OECD**: San Marino, Vatican City

Data tables

Table A.2: Public climate finance by actors and instrument (average for 2019 to 2020, USDbn)

Actor type	Balance sheet financing (debt portion)	Balance sheet financing (equity portion)	Grant	Low-cost project debt	Project-level equity	Project-level market-rate debt	Unknown	Grand total
National DFI	0	0	1	29	0	115	0	145
Multilateral DFI	0	0	3	13	2	44	6	68
State-owned FI	34	0	0	0	0	11	0	45
Government	2	5	20	0	4	0	1	32
Bilateral DFI	0	0	1	16	0	6	0	24
SOE	0	7	0	0	5	0	0	13
Multilateral Climate Funds	0	0	2	1	0	0	0	4
Public Fund	0	0	1	0	1	0	0	2
Export Credit Agency (ECA)	0	0	0	1	0	0	0	1
Unknown	0	0	0	0	0	0	0	0
Grand Total	**36**	**13**	**29**	**60**	**12**	**178**	**7**	**335**

Source: Global Landscape of Climate Finance: A Decade of Data (CPI, 2022)

Table A.3: Private climate finance by actors and instrument (average for 2019 to 2020, USDbn)

Actor type	Balance sheet financing (debt portion)	Balance sheet financing (equity portion)	Grant	Low-cost project debt	Project-level equity	Project-level market-rate debt	Unknown	Grand total
Corporation	3	85	0	0	33	4	0	125
Commercial FI	69	0	0	0	1	51	0	122
Households/ Individuals	0	55	0	0	0	0	0	55
Unknown	4	2	0	0	0	0	1	7
Funds	0	1	0	0	3	1	0	5
Institutional Investors	0	1	1	0	1	1	0	4
Grand Total	**76**	**143**	**1**	**0**	**39**	**58**	**1**	**318**

Source: Global Landscape of Climate Finance: A Decade of Data (CPI, 2022)

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