

Financing the Low-Carbon Transition: Current Landscape and Future Direction

➤ Current sources

Existing flows of global climate finance (at least \$391 billion per year) are sourced primarily from Development Finance Institutions (DFIs) and project developers themselves.

➤ The gap

A substantial 'investment gap' remains between the existing levels of climate finance, and those required to achieve the requisite level of decarbonisation to maintain a 2°C pathway (over \$1 trillion per year).

➤ The solution

Institutional investors hold the greatest potential for filling the investment gap because they hold about \$ 93 trillion worth of assets and seek long-term, stable returns, which are potentially available from climate finance investments. They currently contribute little to existing climate finance flows (~0.2 %).

➤ Making it happen

Further research by the GREEN-WIN project seeks to determine how to effectively develop the drivers and alleviate the barriers faced by institutional investors for deploying the finance required to develop the low-carbon, climate-resilient economy.

Who is currently financing the low-carbon transition, and how?

Climate finance reached \$391 billion in 2014

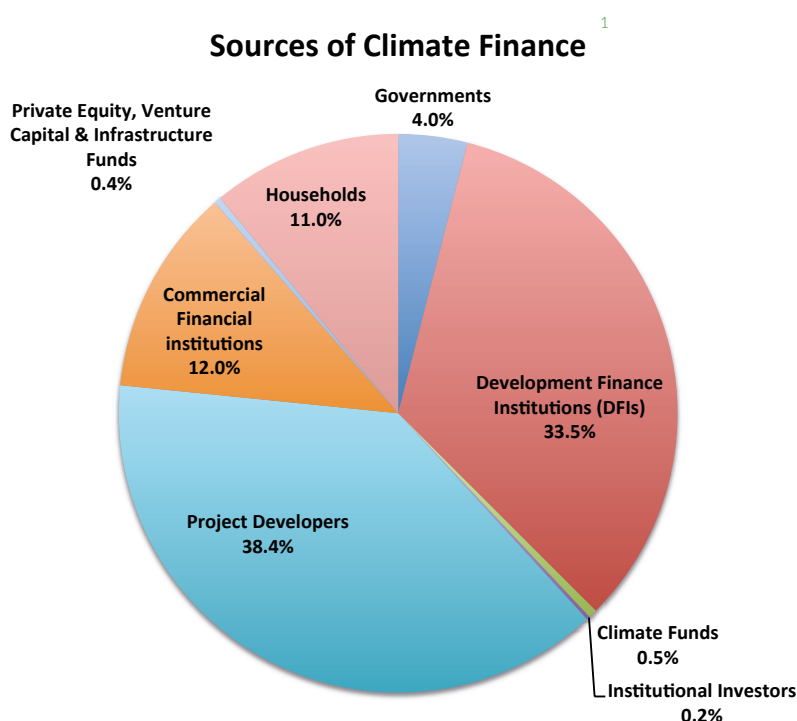
In 2014, flows of 'climate finance' around the world reached at least \$391 billion (see box below for definitions). 93% of this was invested in activities to reduce the emission of greenhouse gasses (GHGs) (climate change mitigation). In turn, 81% of this went to the deployment of renewable energy (mainly wind and solar), with the remainder largely channelled toward energy efficiency and sustainable transport.¹ Investments in adapting to climate change accounted for 7% of climate finance. Although such investments are important, and likely to become increasingly so, this brief focuses on climate finance required to deliver the low-carbon transition.

What is 'climate finance'?

In this Brief we use the definition of 'climate finance' employed, and the data presented, by the Climate Policy Initiative (i.e. capital flows directed towards low-carbon and climate-resilient development interventions with direct or indirect greenhouse gas mitigation or adaptation benefits).² However, other organisations consider different definitions, scopes and terminologies; e.g. 'New Energy Finance', 'Green Finance' and 'Renewable Energy Investment'. While all such definitions include renewable energy, they range in their consideration of energy efficiency investments, energy storage technologies and environmental goods and services (those produced for the purpose of environmental protection, or safeguarding against resource depletion).^{3, 4, 5}

Generally, the broader the definition of climate finance employed, the more prevalent are data limitations. The Climate Policy Initiative excludes private investments in energy efficiency, transport, adaptation and land use, and some elements of public budgets for domestic investment (e.g. those not channelled through intermediaries or tracked by Bloomberg New Energy Finance). The value of such investments, in addition to the \$391 billion presented above, is estimated to be at least \$150 billion a year.¹

Of this \$391 billion, the private sector contributed around 62 %, with the public sector providing 38 %. The chart below illustrates the breakdown between different private and public sector actors. In the private sector, project developers and commercial banks are dominant. Such actors primarily employ ‘on balance sheet’ funding (i.e., direct investment using the company’s funds), and project-level debt and equity. Households primarily invested their own capital in small-scale solar photovoltaic and thermal systems. In the public sector, Development Finance Institutions (DFIs), including national, bi-lateral and multilateral development banks, account for the vast majority of investment. DFIs also principally invest at the project level, through market-rate and concessional loans, but also provide technical assistance and risk mitigation services (e.g. investment guarantees). By contrast, the majority of government support is provided through grants.¹



Are the existing flows of climate finance sufficient?

A substantial investment gap remains

In order to limit GHG emissions to a level that would prevent an average temperature rise to 2°C above pre-industrial levels, the International Energy Agency (IEA) estimate that an additional \$40 trillion global cumulative investment in low-carbon technologies and energy efficiency between 2016 and 2050 (over \$1 trillion a year on average) is required, compared to a situation in which we did not seek to reduce emissions.⁶ Investments required in adaptation activities, of which estimates vary substantially, are in addition to this. Although climate finance flows in 2014 were the highest annual levels recorded, they are less than half the annual levels required. A substantial investment gap therefore remains.

*Institutional
investors hold
assets worth
\$93 trillion*

Which actors hold the greatest potential for closing the 'investment gap'?

Although all actors presented in the chart above may further contribute to closing the investment gap, the most significant potential rests with the group that at present contributes the least. Institutional investors, which as the chart above illustrates accounted for just 0.2 % of total climate finance flows in 2014 (under \$1 billion), hold assets worth around \$93 trillion. The two principal categories of institutional investor are pension funds and insurance companies.

Pension funds (particularly those that operate with defined benefits), have relatively predictable long-term liabilities, and thus seek low-risk (and therefore relatively low-return) and less liquid investments to deliver inflation-protected income-streams.⁷ They invest principally in equities and bonds, although a recent move to 'alternative assets' (e.g. real estate) has been observed.⁸ However, since 2000 there has been a shift to defined contribution pension plans in many OECD countries, reducing the investment horizon and increasing demand for liquid assets.⁸

Life insurance companies also hold largely predictable long-term liabilities, and allocate a substantial proportion of their assets to debt (with nearly three quarters of their asset allocation generating fixed income⁸). As with defined contribution pension funds, non-life insurance companies (predominantly property and casualty companies) have less predictable liabilities, and thus allocate their assets to shorter-term, more liquid investments.

Low-carbon technologies and energy efficiency investments are typically capital intensive, and produce low, but generally fixed or relatively predictable long-term annual returns. This, coupled with the large value of capital under management by institutional investors and their 'search for yield'⁹ in times of low interest rates means that institutional investors, particularly life insurance companies and the remaining defined benefit pension funds, are potentially able to play a decisive role in closing the investment gap. However, this potential is currently not being realised.

Why are institutional investors not realising this potential?

There are various barriers to low-carbon investment

There is a range of barriers preventing more extensive investments in the low-carbon economy by institutional investors.

The transaction costs involved in directly issuing project-level debt may be significant, as the investor must conduct the appropriate due diligence, which may require extensive technology and location-specific expertise. As such, small and medium-sized projects (below \$50 million¹⁰) may not be able to attract finance from institutional investors. Similarly, the ability and willingness of a company or fund to absorb such costs depends on its size. The majority of pension assets are managed by relatively small funds⁸, whilst the insurance market is dominated by large companies, more able to justify substantial transaction costs as a primary investor. However, in Europe, insurance companies are subject to the 'Solvency II' regulation, which is intended to ensure the financial security of insurance companies, by setting financial reserve rules for different asset classes. This means that project-level, illiquid debt (e.g., direct investments in low-carbon technologies) becomes substantially more expensive, by requiring companies to hold reserves against such investments.⁸

However, even in the absence of such constraints, other key barriers remain. For example, regulations in some jurisdictions restrict the share of a portfolio that may be allocated to different asset classes (e.g., Germany's Pensionkasse may not invest more than 15% of their portfolio in private equity⁷). Evidence also suggests that institutional investors hold a preference for investing in 'brownfield' assets and infrastructure (i.e., those that already exist), in order to avoid the construction phase risks associated with 'greenfield' investments.¹⁵ Additionally, regardless of the liquidity requirements imposed by Solvency II, many institutional investors focus their investing strategies on relatively liquid and short-term assets. Such strategies may form part of a longer-term investor mandate, be a result of other incentives and requirements set by the regulatory framework, or other factors, such as the structure of the reward framework for investment managers.¹¹

An instrument that seeks to overcome these issues is a '**green bond**'; a tradable, fixed-income security issued to raise capital for 'green' projects. The green bond market first emerged in 2007 and its value has grown rapidly since, reaching \$11 billion in 2013, \$35 billion in 2014 (around 10% of total climate finance in this year¹), and \$66 billion in 2015. Despite this rapid growth, green bonds accounted for just 0.3% of all bonds outstanding in 2015.¹² Additionally, it is not clear the extent to which green bonds provide 'additionality' (i.e., finance projects that would not be funded otherwise). There is the risk that some issuances do not attract new, additional investment to low-carbon projects, but represent re-branded standard bonds that would have been issued anyway without a 'green' label. Initiatives such as the Green Bond Principles developed by the International Capital Market Association (ICMA), seek to address this issue.

Another innovative instrument is the 'YieldCo'; a limited liability company into which a parent company may bundle assets (e.g., renewable energy generators), where returns are distributed to shareholders through dividends. For an investor, YieldCos offer a dividend linked to the operating performance of the underlying assets, and liquidity in the form of tradable shares. From a developer's perspective, the mechanism may serve to reduce the cost of capital. YieldCos first appeared in 2013 in North America, and by the end of 2015 were worth more than \$14 billion.⁵ However, the success of YieldCos hinge on developments in interest rates (with increasing interest rates making government debt or bonds more competitive)¹³, the policy landscape, and stock market volatility.

Future research priorities

Future research should focus on how to further develop the drivers and alleviate the barriers faced by institutional investors (life insurance and pension funds, in particular), for substantially and rapidly increasing their contribution to global climate finance. This includes what type of instruments hold the greatest potential for attracting institutional investment (e.g. Green Bonds), what must be done to maximise their potential, and whether there are specific sectoral or geographical challenges that must be overcome to do so.

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Green growth and win-win strategies for sustainable climate action (GREEN-WIN)

The GREEN-WIN Project identifies, develops and critically assesses win-win strategies, green business models and green growth pathways that bring short-term economic benefits, while also supporting mitigation and adaptation goals within the broader sustainable development agenda.

Work programme

- At national levels, GREEN-WIN analyses win-win opportunities that arise through integrating policies across different sectors, and advances state-of-the-art macro-economic models in order to identify green growth pathways.
- At local levels, GREEN-WIN carries out action research case studies to develop green business models and enabling environments in the following three areas: i) coastal flood risk management in Jakarta, Kiel, Rotterdam and Shanghai; ii) transformations in urban systems in Barcelona, Istanbul, Shanghai and Venice; and iii) energy poverty and climate-resilient livelihoods with case studies in India, Indonesia and South Africa.
- Cutting across both levels, GREEN-WIN investigates financial products and policies, as well as financial system reforms that redirect financial flows towards sustainability and climate action.
- All of these activities are embedded in an open dialogue between research institutes, international organisations, business, and civil society that co-develops shared narratives around win-win strategies, business opportunities and green growth pathways

Project partners

Global Climate Forum (GCF), Germany (coordinator) | The Institute of Environmental Sciences and Technology, Autonomous University of Barcelona, Spain | E3-Modelling, Greece | Environmental Change Institute, Oxford University, UK | Ecole d'Economie de Paris, France | University College London, UK | The Ground_Up Association, Switzerland | Stichting Deltares, The Netherlands | Institute for Advanced Sustainability Studies, Germany | Global Green Growth Institute, Republic of Korea | Jill Jaeger, Austria | European Centre for Living Technology at Università Ca' Foscari Venezia, Italy | Institute of Environmental Sciences at Boğaziçi University, Turkey | Universitas Udayana, Udayana University, Indonesia | University of Cape Town, South Africa | 2° investing initiative, Paris



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