

## Climate Finance

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# Climate Finance

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## Synonyms

Carbon finance; Global climate finance; Green finance; Low-carbon finance; Sustainable finance

## Definition

Climate finance refers to local, national, or transnational financing for climate change mitigation and adaptation of related activities drawn from public, private, and alternative sources. There is no single definition of climate finance. It is, in some instances, discussed separately but often integrated with related and overlapping concepts of green, sustainable, or low-carbon finance.

The United Nations Framework Convention on Climate Change (UNFCCC) has defined climate finance as *"finance that aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts."*

This definition encapsulates climate finance in its broadest form, as it represents the funding of all activities and projects that take climate change mitigation and adaptation into account. A broad definition is necessary as climate finance consists of many different elements such as the type of financing that is provided, the source of financing, flows of financing, what is financed, and whether climate change mitigation is the major or minor element of the activity. Climate finance is, however, most often utilized in the context of climate change negotiation processes, wherein the aim is to provide additional financial resources from developed to developing countries for climate change mitigation and adaptation activities that are unlikely to occur without additional financing.

## Introduction

Climate finance aims to provide the financial means for implementing the transition to a sustainable low carbon and climate resilient economy in line with the 2 °C goal set by the Paris Agreement on Climate Change. However, how the financing of the transition will be done is still an open question. In 1992, UN member states agreed that those responsible for climate change should compensate for caused emissions by financing mitigation and adaptation activities. Global effort is needed as the contribution of countries to climate change and their capacity to prevent it and cope with its consequences varies enormously.

According to the Climate Policy Initiative (CPI 2018), the global climate finance flows are increasing. The average annual flow of climate finance was USD 463 billion during 2015–2016. Private sectors, such as project developers, banks, and corporations, provided the major share of climate investments (54 %) in the 2015–2016 period (Fig.1). Estimates for finance flows in 2017 range from USD 510 billion

to USD 530 billion. However, adaptation finance flows are estimated to be just USD 22 billion per year because of lack of private investments. The vast majority of investments (81%) were spent domestically during 2015–2016, and most of the international flows were from OECD to non-OECD countries. More specifically, the dominant international destinations were in East Asia and in the Pacific region during 2015–2016. Finance flows are mainly concentrated in the renewable energy sector (approximately USD 300 billion). Water and wastewater management projects are the largest sectors when it comes to adaptation finance, followed by agriculture, forestry, and land-use adaptation activities (CPI 2018).

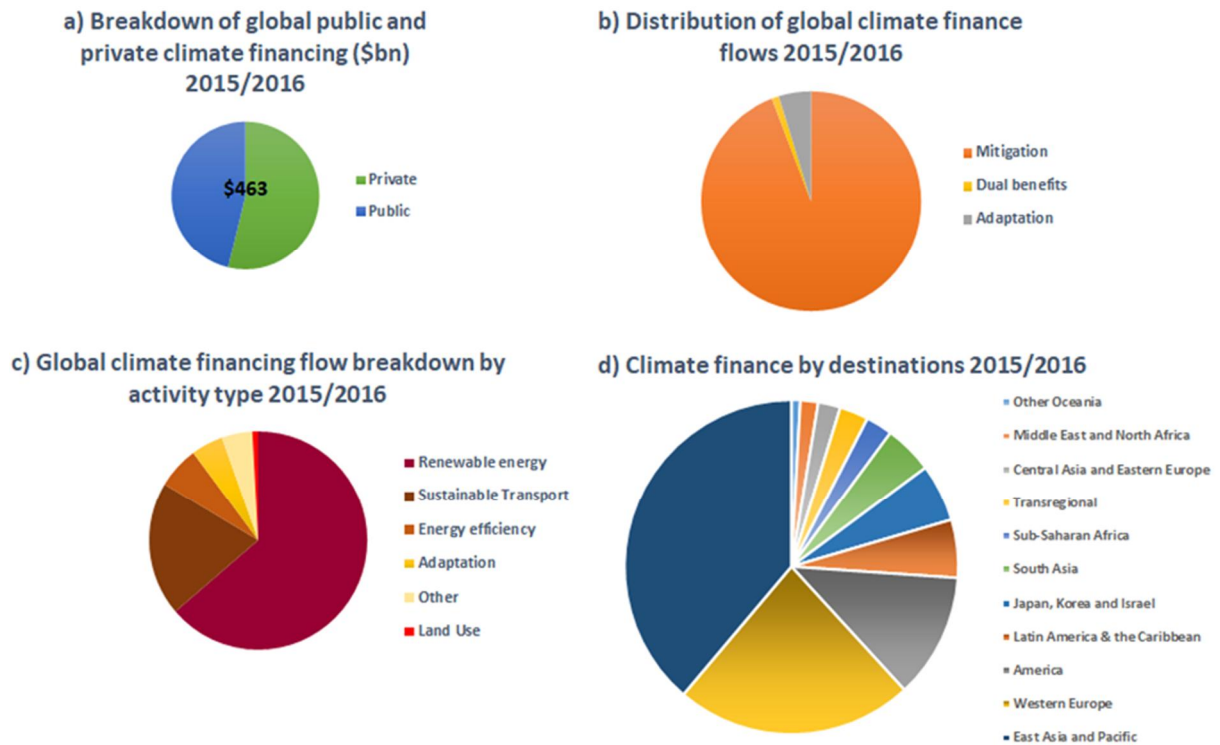


Fig. 1 Breakdown of global public and private climate financing during 2015-2016 (\$bn), b) Average distribution of global climate finance between private and public flows during 2015 and 2016, c) Proportions of global climate financing for mitigation and adaptation, d) Climate finance by destination during 2015- 2016. (CPI 2018).

To achieve the goal of limiting warming set at 2 °C in the Paris Agreement, global annual emissions need to be less than 42.51 GtCO<sub>2</sub>e in 2030, while 1.5 °C pathways annual global emissions need to be about three quarters of that at 33.94 GtCO<sub>2</sub>e (UNCCC 2019). The Intergovernmental Panel on Climate Change (IPCC) reports showing a USD 1.6-3.8 trillion requirement for further investments to sustainable energy systems to keep warming within a 1.5 °C scenario (IPCC 2018). In 2009, developed countries committed (COP15) to mobilize USD 100 billion annually by 2020 for climate action in developing countries. According to the UNEP Adaptation Gap report (2016), developing countries would need to invest between USD 140 billion and USD 300 billion per year by 2030 in order to adapt to a 2° C future. This means that estimated costs are 9-19 times higher than current levels of international public adaptation finance to avoid an adaptation finance gap in 2030 (Oliver et al. 2018).

## Finance Mechanisms

In order to incentivize and hasten sustainable transformation, multiple mechanisms have been implemented. These mechanisms are divided into two main categories: voluntary and mandatory

mechanisms. Mandatory markets are founded upon negotiation processes, which set regulatory requirements on the participants. The most prominent of these negotiation processes was the establishment of emissions trading under the Kyoto protocol. Each ratified country is set an emissions target and a corresponding number of allowances. Countries can meet their targets by limiting emissions or by purchasing carbon credits from countries that have a surplus of allowances. The Kyoto Protocol also established the so-called Flexible Mechanisms, the Clean Development Mechanism (CDM), and Joint Implementation (JI), to increase cost-effectiveness of emission reductions. The CDM allows developed countries to partly meet their Kyoto targets by financing carbon emission reduction projects in developing countries. The aim, in CDM, is that the developed country can implement its reduction goals in a developing country, wherein it is the most cost effective, while offering sustainable development benefits where the implementation takes place. JI works similarly to CDM, with the exception that the host country is a developed country as well. (UNFCCC 2005). New market based mechanisms are being developed (e.g. the new market mechanism (NMM)), but these mechanisms have not been codified yet (Gao et al. 2016).

A group of European countries created the EU Emissions Trading Scheme (EU-ETS), where allowances may be traded among participating countries. The EU-ETS began its operations in 2005, and is the largest emission trading scheme. There are, currently, dozens of regional, national, or transnational systems in the World, operating under or independently of the Kyoto Protocol. They have been established, for example, in Canada, in California, in the East Coast of the United States, and in eight Chinese provinces. China's national emissions trading scheme is expected to start operating during 2020 (Cao et al. 2019).

The voluntary carbon markets function independently from and additionally to the regulatory law and compliance markets, enabling private entities to voluntarily offset their emissions by purchasing offsets that were created either in the voluntary market or in the CDM. There are no established specialized rules and regulations, such as those set by the US Securities and Exchange Commission, for the stock exchange of the voluntary carbon market. This lack of overhead allows for innovation and experimentation, as projects can be implemented with fewer transaction costs than compliance market projects, making it feasible to also implement micro-sized projects. Conversely, the lack of quality control has led to the production of some low-quality credits, such as those from projects that would have likely happened anyway; thus, the offset credit produced does not always fulfill the additionality criteria.

Multilateral climate funds are one of several ways how climate finance flows are distributed. The climate funds play an important role in supporting vulnerable communities in developing countries to transform into clean technology and climate resilient economies. More than 1,000 projects are being funded by the four main climate funds; the Green Climate Fund (GCF), Adaptation Fund (AF), Climate Investment Fund (CIF), and Global Environment Facility (GEF). CIF accelerates climate action by empowering transformations in clean technology, energy access, climate resilience, and sustainable forests in developing and middle-income countries. While GCF finances both adaptation and mitigation projects, GEF is largely dedicated to mitigation. AF was established to finance practical adaptation projects and programs in developing countries that are parties of the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change. Most of the largest number of projects funded so far by the leading funds are in Mexico, followed by India, Cambodia and South Africa (CB 2017).

## Lessons Learned

Climate financing has two relevant variables and stakeholder goals: monetary gain and emissions reduction, or sequestration amount. Thus, it is pivotal to consider the fact that mere climate financing flow does not necessarily correspond to effective emissions reduction as the used monetary amount

does not give an indication of how much carbon was abated. To achieve more transparency, climate financing flows should be connected and standardized according to the actual, measured climate effect whenever possible. Second, with standardization, the complexity of the climate financing could be simplified to a few key indicators that are the most important for the activity, usually monetary gain, cost, carbon reduction, and sequestration achieved. This transparency and simplicity would help ensure that the goals of different stakeholders are met and that decision-makers are selecting the best available methods and technologies to combat this difficult challenge. One successful decision-making tool when choosing and assessing carbon abatement measures has been the usage of marginal abatement cost (MAC) curves, which indicate the marginal cost of each additional unit of carbon reduction or sequestration. However, implementation from country to a smaller project scope is recommended so that utilization of the most efficient carbon solutions becomes an ordinary and habitual part of decision-making (Ibrahim and Kennedy 2016).

The carbon prices collapsed during the economic recession. Thus, the cost of carbon emissions was not significant enough to convince industries to invest in carbon reduction in accordance with national targets. Different mechanisms have been created to ensure carbon prices that incentivize investments in carbon reduction. In EU, the ETS carbon trading scheme was reorganized to have a depository of excess carbon credits, which immediately increased emissions allowance prices. The prices climbed up to 30 euros per ton, which was a sufficient price to influence companies' investment decisions to take into account the lower emissions targets. In the United Kingdom, the Carbon Price Floor (CPF) was introduced in 2013 to support the EU-ETS by taxing fossil fuels used to generate electricity via Carbon Price Support rates set under the Climate Change Levy. Since the implementation of the CPF, there has been significant reduction in coal electricity generation, which has partly been attributed to the CPF (Hirst 2018).

Besides the reduction of emissions, one major challenge is the adaptation, especially in the developing countries that do not have the infrastructure nor the resources to alleviate the effects of climate change. According to the latest finance flow data, only USD 22 billion was directed toward adaptation, wherein the estimated amount needed to alleviate climate change is between USD 280 billion and USD 500 billion in the year 2050 (UNEP 2016). Consequently, in order to prevent loss of biodiversity and worsening of living conditions, over ten-fold increase in adaptation flows is needed. According to Hallmeyer and Tonkonogy (2018), there are several barriers that explain the lack of financing when it comes to adaptation, both in private and public sectors, especially in developing countries. Their barrier framework identifies three distinct categories: context, business model, and internal capacity barriers. In an adaptation finance scheme, context barriers refer to gaps in regulatory stability, enforceable laws, and the protection of property rights, especially in developing countries where adaptation finance is most needed. Business model barriers are specific to the context of the product or service being offered, and refer to uncertainty of investment returns, high upfront costs, and lack of technical capacity to implement and maintain adaptation products. Internal capacity barriers refer to the scalability of adaptation services and products.

## Summary

Although climate financing flows are increasing, hundreds of billions of dollars or more will still need to be mobilized to achieve transition to a low carbon resilient economy. If this is to be accomplished, multiple different measures need to be implemented, especially to activate investments of the private sector into emerging economies. One of these measures is to make the data more accessible to the decision-makers by quantifying and representing complex issues with key metrics, such as with MAC curves or other analysis tools, so that each choice between activities becomes comparable in terms of cost and climate change abatement. Second, there should be compelling incentives for each stakeholder to make carbon emission reducing investments and decisions based upon those key metrics.

## Cross-References

Cap and Trade/Emissions Trading Scheme  
Carbon Offsets  
Carbon Trading Schemes  
Emissions trading  
Clean Development Mechanism (CDM)  
Clean Development Mechanism (CDM) II  
Kyoto Protocol

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