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renewables academy

Online course

Climate finance

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Climate Finance

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1 Introduction to climate finance

1.1 Introduction to the course

Climate finance is a topic with many facets. Governments are increasingly aware that greenhouse gas emissions harm the climate system and that a global rising temperature can have severe impacts on many countries around the world. Thus, different climate finance mechanisms have been developed in the last decades. The amount of finance available labelled as "climate finance" will increase further, which shows the significance of this topic for providers of finance, for project developers, for governmental institutions, for NGOs and many more stakeholders.

This course shows the variety of climate finance issues and introduces different mechanisms, institutions and projects. At first, definitions are given and the volume and flow of money is explained. Then, global mechanisms are explained, e.g. those provided by the UNFCCC, by multilateral development banks or domestic financing sources. The chapters 2, 3 and 4 provide insights into mechanisms, instruments and institutions acting on a large scale.

The chapters 5 and 6 provide details on microfinance projects, which are equally important in the climate finance landscape, but follow a different approach compared to the conventional finance by commercial or public banks.

1.2 Climate finance definitions

Learning objectives: after this session you should be able to …

- Define the concept of climate finance
- Compare different rationalities regarding the relationship of ODA and climate finance

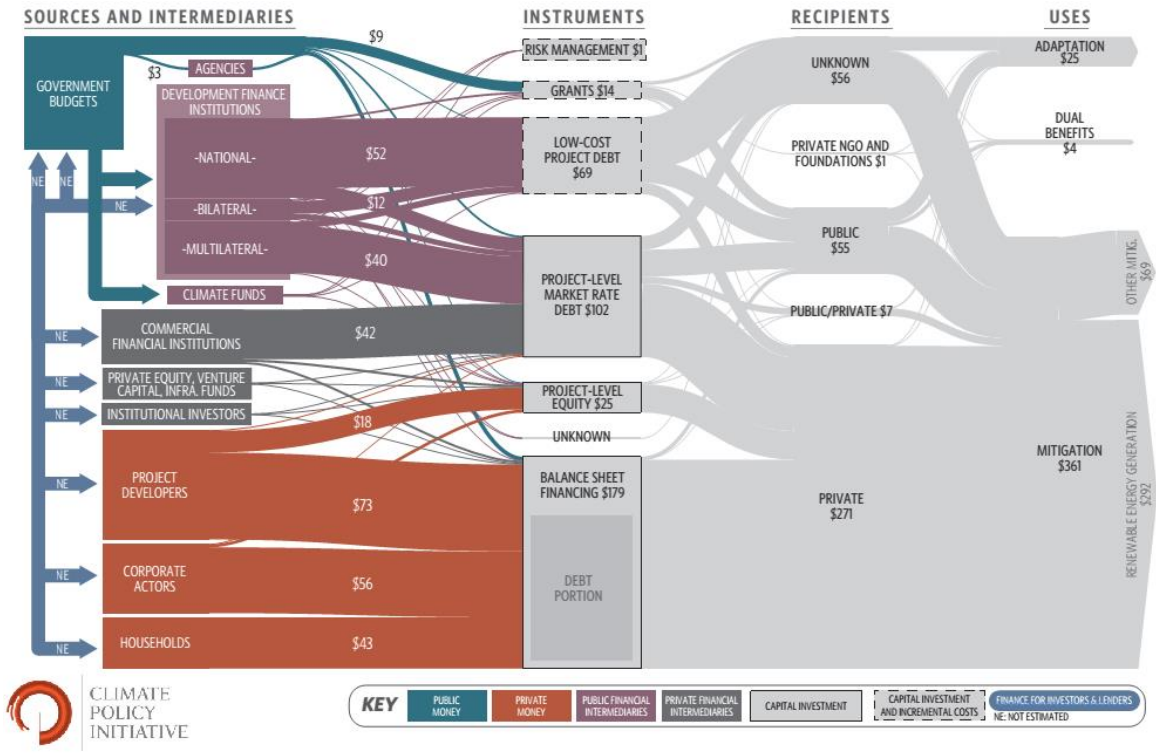
The UNFCCC refers to climate finance as local, national or transnational financing, which may be drawn from public, private and alternative sources of financing. Climate finance is critical to addressing climate change because large-scale investments are required to significantly reduce emissions, notably in sectors that emit large quantities of greenhouse gases (GHG).

Climate finance is equally important for adaptation, for which significant financial resources will be similarly required to allow countries to both adapt to the adverse effects and reduce the impacts of climate change.[1] In reality though, the vast majority of climate finance flows into mitigation and only 7% is invested into adaptation measures.

Climate finance can come in various shapes, including grants, low-cost project debt and risk mitigation instruments (including insurances and financial risk guarantees).

It can come from government budgets and public institutions like Development Banks (public climate finance) or from private investors and financial institutions (private climate finance).

[1] UNFCCC (n.d.)



1.3 **Climate finance commitments by developed countries**

Learning objectives:

- Quantify the amount of climate finance currently made available by developed to developing countries
- Quantify and describe the commitment made by developed countries for the upcoming decade
- Identify different sources of climate finance made available

At the 2009 climate change summit in Copenhagen, Developed Country Parties to the UNFCCC committed to making USD 100 billion a year available in additional climate finance "from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources"[2] to developing countries from 2020 onwards.

To get things going, immediate "fast-start" finance (FSF) was committed until the end of 2012. Developed countries report that between 2010 through 2012 they mobilised USD 35 billion for climate change in developing countries.[3] Independent research showed that "not all of this funding is new or additional".[4] But it helped fund important initiatives through multiple channels, including the Global Environment Facility (GEF), the British International Climate Fund (ICF), the German International Climate Initiative (IKI), and Danish funding, plus the Multilateral Development Banks' Climate Investment Funds, many of which will be discussed in later sections of this module.

[2] UNFCCC (2010)

[3] ODI et al. (n.d)

[4] ODI et al. (n.d)

Several reports[5] track the progress towards the USD 100 billion goal. In 2014 an estimated USD 62 billion were mobilised for climate related financing according to the OECD's definition. This includes export credits and private investments.[6]

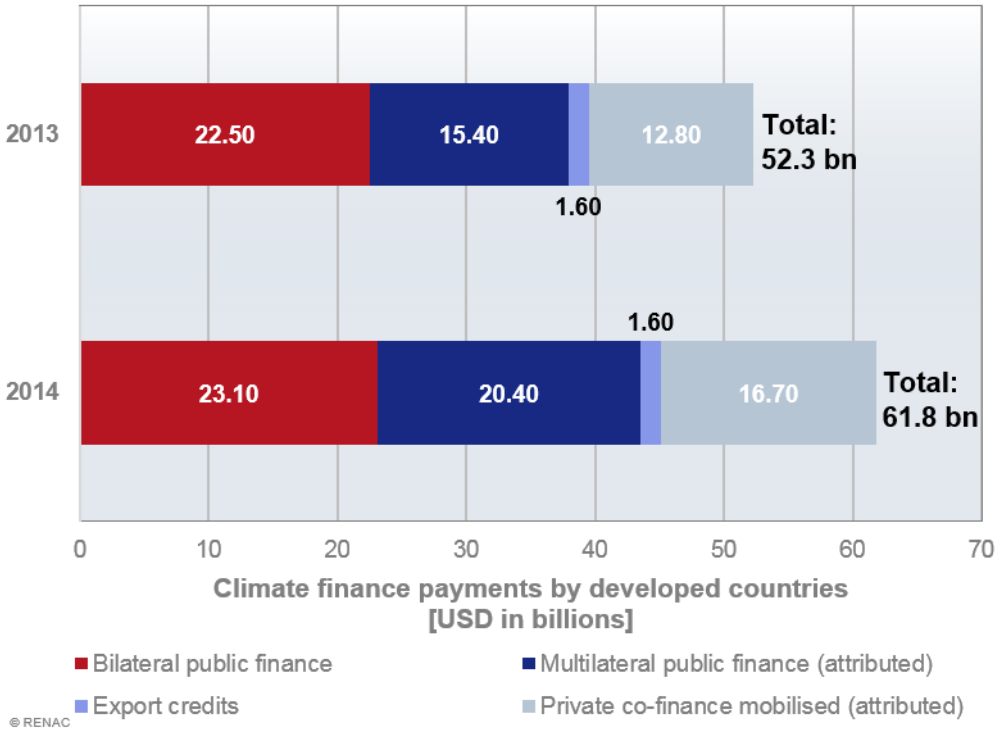
An important debate in climate finance transfer is its relationship to Official Development Assistance (ODA). Competing definitions exist with significant implications regarding the amount offered to developing countries. Developed countries understand climate finance as either:

a) additional to their 0.7 ODA target;

b) an increase compared to 2009 levels;

c) additional to the level of ODA in nominal terms; or

d) an increase from new sources.



1.4 **Climate finance: how much money is needed?**

Learning objectives: after this session you should be able to …

- Match different emission scenarios with global temperature rise
- Grasp the investment shift necessary to arrive at climate neutrality and resilience and to identify areas with the highest investment need

In 2014, the concentration of CO_2 equivalents in the atmosphere reached 441 *parts per million (ppm)*, whilst a maximum concentration of 450 ppm is expected to be necessary to limit global temperature

[5] For example: Group of 19 bilateral climate finance providers (2015)

[6] OECD (2015a)

rise between 1.5 to 3.9°C, with a 50% chance of missing the 2°C target.[7] In this scenario, several small island states could disappear entirely.[8] It would be safer to reduce the GHG concentration to 350 ppm, which would give a higher chance of limiting warming to 1.5°C.

Estimates for how much money is required to limit global temperature rise between 1.5°C to 3.9°C vary widely. One of the latest estimates puts the investment need in green infrastructure at USD 5,700 billion annually – about the GDP of the UK and France combined[9] – in order to achieve the 2°C scenario. The majority of this investment includes greening investment that would be carried out in the business as usual (BAU) scenario, with only USD 700 billion being additional investment – comparable to the GDP of Switzerland. However, these costs of mitigation are small relative to the costs of the climate change that will be avoided through them. To adapt to a world with a 2°C higher average temperature, developing countries alone will require an estimated annual investment of USD 120 billion until 2030.[10]

With respect to the energy sector, other reports such as Citi (2015) conclude that a low-carbon pathway would result in a positive return on investment. Citi concludes that the investment costs in the *Action Scenario* versus *Inaction Scenario* are almost identical. Because of fuel savings and increased energy efficiency, *Action* is actually cheaper than *Inaction*. Other studies have gone beyond this and analyse what it would take to limit climate change to 1.5°C[11] – check the further reading for different scenarios.

1.5 **Climate finance flows**

Learning objectives: after this session you should be able to …

- Match different climate finances with different actors/sources
- Name the most important sources of climate finance
- Rank global regions by their climate finance investment

According to the *Global Landscape of Climate Finance*, an annual report published by the Climate Policy Initiative (CPI), the total of climate finance for mitigation and adaptation measures reached more than USD 391 billion in 2014 with private finance contributing USD 243 billion and public finance USD 148 billion.

As shown in the figure the CPI report differentiates between the following **public sources**: (1) national Development Finance Institutions (DFIs), (2) multilateral DFIs, (3) bilateral DFIs, (4) governments and agencies, and (5) Climate Funds.

Among the **private sources**, it differentiates as follows: (1) project developers, (2) corporate actors, (3) household, (4) commercial financial institutions, (5) private equity/venture capital/infrastructure funds, and (6) institutional investors.

The CPI report demonstrates that climate-relevant finance does not necessarily cross borders. About 74% of total climate finance flows, and up to 92% of private investments were raised and spent within

[7] OECD (2012)

[8] Bawden, T. (2015)

[9] World Bank (2016)

[10] Amar Bhattacharya et al.(2015)

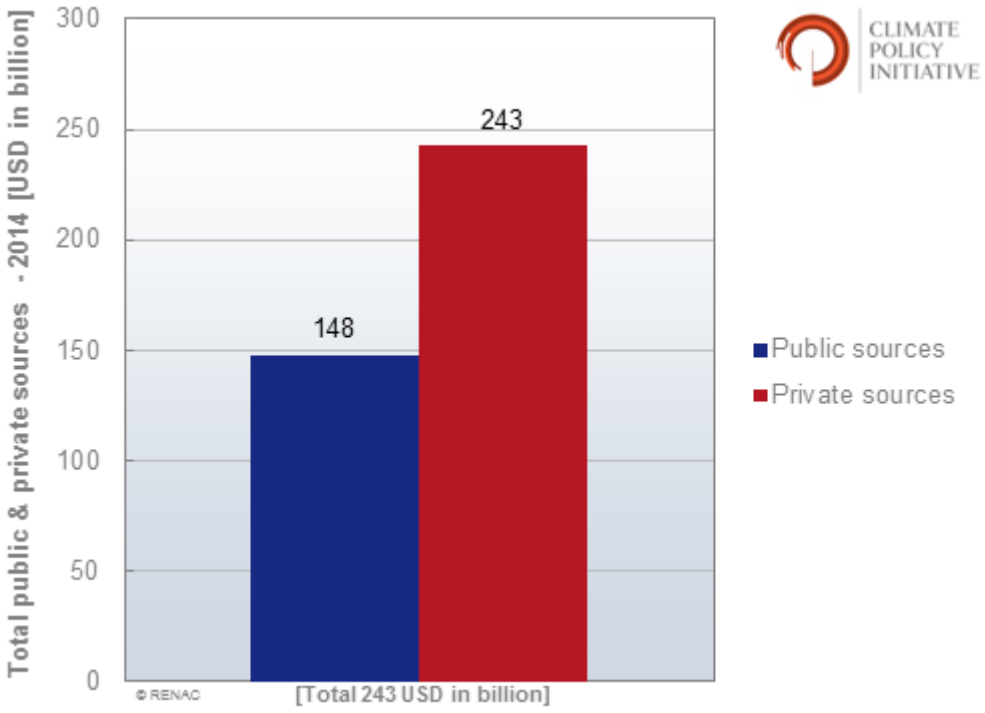
[11] Rogelj, J. et al. (2015)

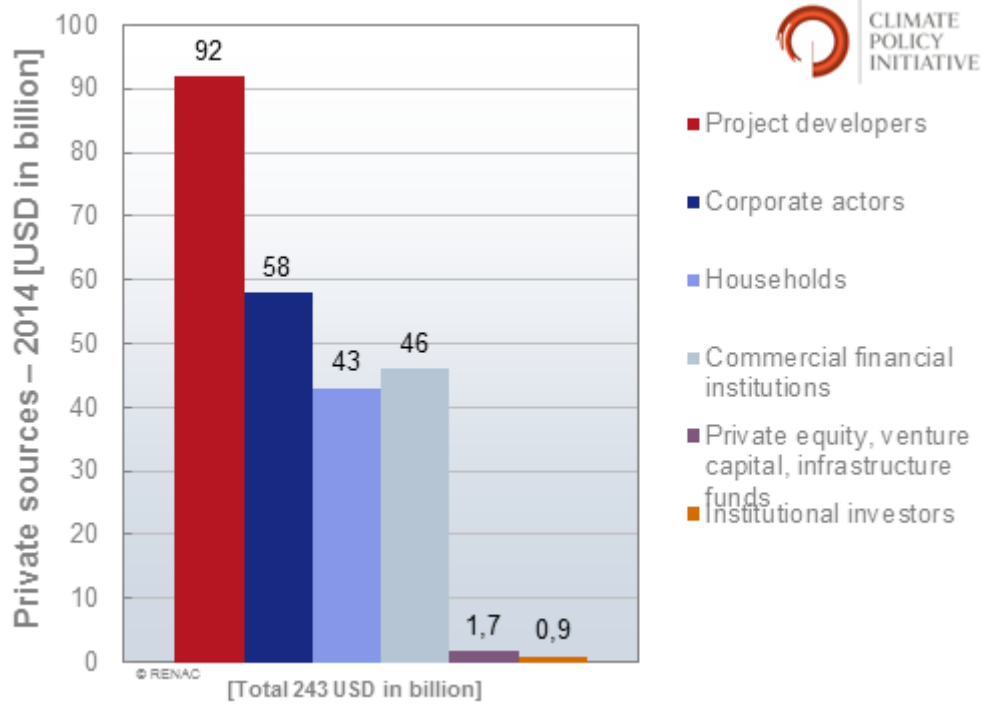
the same country. Most of the investment stream of USD 391 billion in 2014 was carried out within industrialised countries.[12]

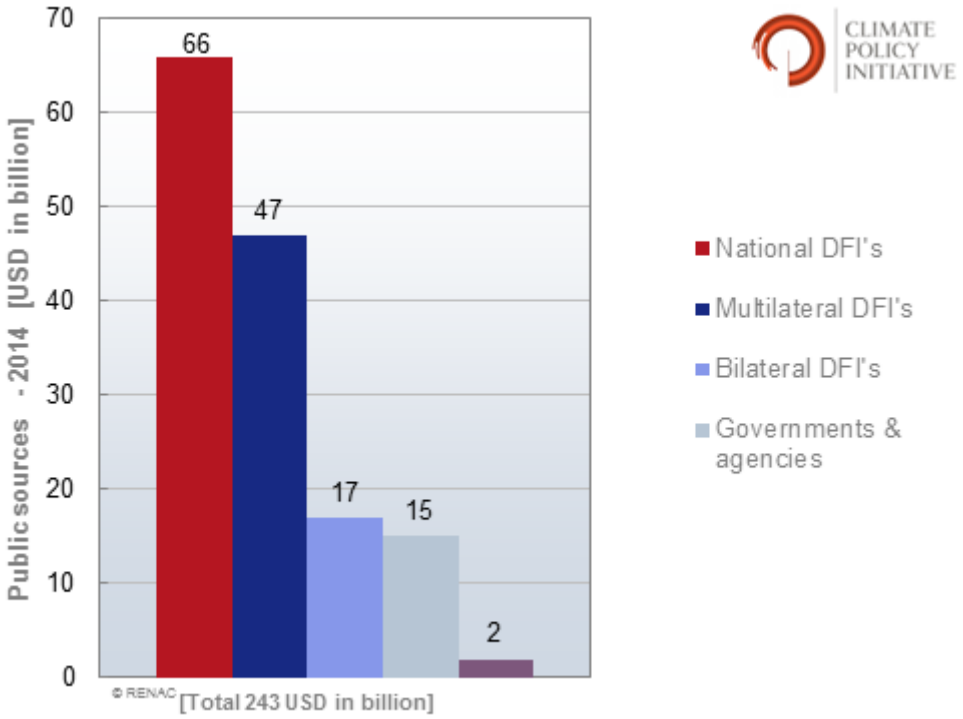
In a regional analysis most of climate finance was spent in the East Asia and the Pacific region, accounting for 31% of the total or USD 119 billion. China alone accounted for 22% of global climate finance. 10% of the global total was spent in the rest of the East Asia and Pacific region. With 24% of the total or USD 93 billion, Western Europe was the second major spending-location. In Latin America and the Caribbean 7% (USD 28 billion) was spent.[13]

[12] Nanki Kaur et al. (2015)

[13] CPI (n.d.)


Total public & private sources - 2014 [USD in billion]
300
250
200
150
100
50
0
243
148
© RENAC
[Total 243 USD in billion]
CLIMATE POLICY INITIATIVE
Public sources
Private sources


Private sources – 2014 [USD in billion]
100
90
80
70
60
50
40
30
20
10
0
92
58
43
46
1,7
0,9
© RENAC
[Total 243 USD in billion]
CLIMATE POLICY INITIATIVE
Project developers
Corporate actors
Households
Commercial financial institutions
Private equity, venture capital, infrastructure funds
Institutional investors



Note: Due to data limitations, private finance reported in the Landscape 2015 refers to investment in renewable energy only. The report does not capture domestic public budget for climate related development.

Breakdown of public and private finance by actor, 2012-2014, in USD billion (CPI, 2015a)

1.5.1 Climate finance for mitigation

Learning objectives: after this session you should be able to …

- Give examples for climate mitigation actions
- List the most important areas into which public climate finance is distributed

Of the total climate finance flows discussed before, CPI classifies financial flows as climate change mitigation finance if they contribute to reducing or avoiding greenhouse gas (GHG) emissions or enhance GHG sequestration through the enhancement of sinks and reservoirs.[14]

Examples of possible mitigation activities are the reduction of emissions from:

- the energy sector,
- fugitive emissions in the oil and gas industry,
- urban mass transit, or
- shifting from unmanaged landfills and sewers to modern municipal/industrial waste (water) treatment.[15]

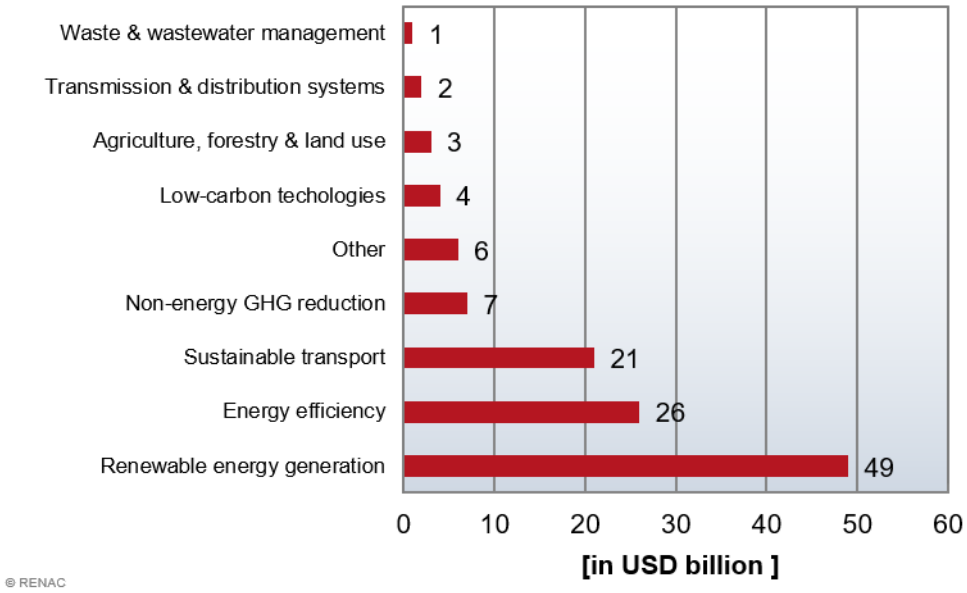
[14] CPI (2014)

[15] CPI (2015b)

The Kyoto Protocol relates to limiting the emissions of five gases besides carbon dioxide: methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). In addition, water vapour is also a greenhouse gas, but its presence in the atmosphere is not directly affected by human activity – all activities that limit the emissions of these gases can be counted towards climate mitigation.

Mitigation accounted for 93% of total climate finance that CPI tracked in 2014, or USD 361 billion.[16] The public mitigation spending of USD 133 billion is less than a third of government subsidies for fossil fuel consumption, which reached around USD 490 billion in 2014 (see our section on energy subsidy reform).

Within public mitigation finance – which is better documented than private spending – a clear bias exists towards renewable energy, with the second highest investment going to energy efficiency followed by sustainable transport. Waste and wastewater management receive smaller funds.



Breakdown of total public mitigation finance by sector, 2014, in USD billion (CPI, 2015a)

1.5.2 Climate finance for REDD+

Learning objectives: after this session you should be able to …

- Describe the different REDD+ initiatives and rank them by volume
- Describe certain trends in financing of agriculture and forestry

Deforestation and forest degradation account for nearly 20% of global GHG emissions. Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests. REDD+ includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.[17] Although not discussed at the UNFCCC level, some hold the vision for a comprehensive carbon accounting across the entire spectrum of Agriculture,

[16] CPI (2015a)

[17] UN-REDD Programme (n.d.)

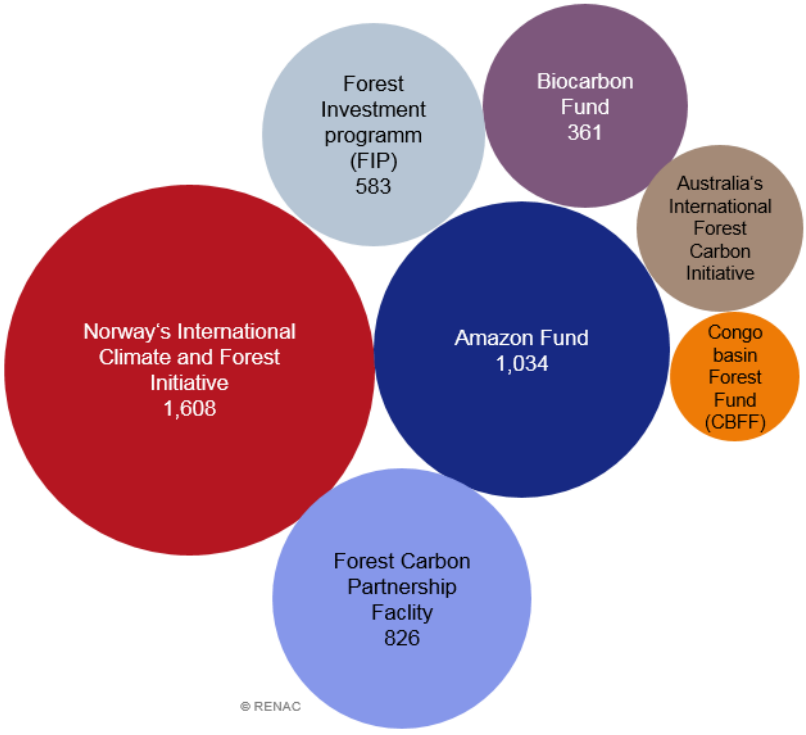
Forest and Other Land Uses (AFOLU), also known as Reducing Emissions from All Land Uses (REALU) or REDD++.[18]

Most current financial flows to agriculture and forestry neither mitigate nor adapt to the effects of climate change, and in some cases may increase emissions or climate vulnerability.[19] The international financing mechanisms that were envisaged to deliver land use investments like ODA and carbon market offset mechanisms have shown limited capacity to induce large-scale shifts of finance from *BAU* to *green*, and cannot compete with the scale of public subsidies for investments that increase land use emissions.[20]

Among many others, the following institutions are active in the field of climate finance against deforestation:

1. Norway's International Climate and Forest Initiative (NICFI)
2. Brazil's Amazon Fund
3. The World Bank's Forest Carbon Partnership Facility (FCPF)
4. The Forest Investment Program (FIP), a REDD-programme of the Strategic Climate Fund (SCF) within the Climate Investment Funds (CIF)

The main REDD+ initiatives received pledges of almost USD 4.5 billion.



Dedicated REDD+ funds (Climate Funds Update, n.d.)

[18] FCPF (2012)

[19] Climate Focus et al. (2015)

[20] Climate Focus et al. (2015)

1.5.3 Climate finance for adaptation

Learning objectives: after this session you should be able to …

- Give examples of climate adaptation activities
- Describe how much finance climate adaptation presumably needs in the future
- Identify institutions that channel climate finance to adaptation

In contrast to mitigation finance, adaptation finance is directed to activities aimed at reducing the vulnerability of human or natural systems to the impacts of climate change and climate related risks, by maintaining or increasing adaptive capacity and resilience.[21]

Examples of possible adaptation activities include:

- climate-resilient infrastructure (e.g. dams),
- installation of domestic rainwater harvesting equipment,
- mangrove planting, and
- national response plans for disease outbreaks.[22]

Many adaptation measures are neither revenue generating nor part of conventional business practices. Thus, compared to mitigation projects, there may be a greater level of need for public climate finance. It is also not always easy to clearly monetise benefits of enhanced resilience, to estimate benefits from reduction of costs that may accrue due to changing climate, or to calculate overall project costs over the long-term.[23]

The most recent estimates show that the developing world will require USD 140 to USD 300 billion annually by 2050 to adapt to climate change.[24] In 2014, public adaptation finance amounted to USD 25 billion .[25]

Finance is channelled through multilateral public channels such as the UNFCCC Adaptation Fund (AF), bilateral public channels like the UK ICF, development finance institutions like the New Development Bank (BRICS), insurances like the Caribbean Catastrophic Risk Insurance Facility or National Funds like the Indonesian Climate Change Trust Fund.

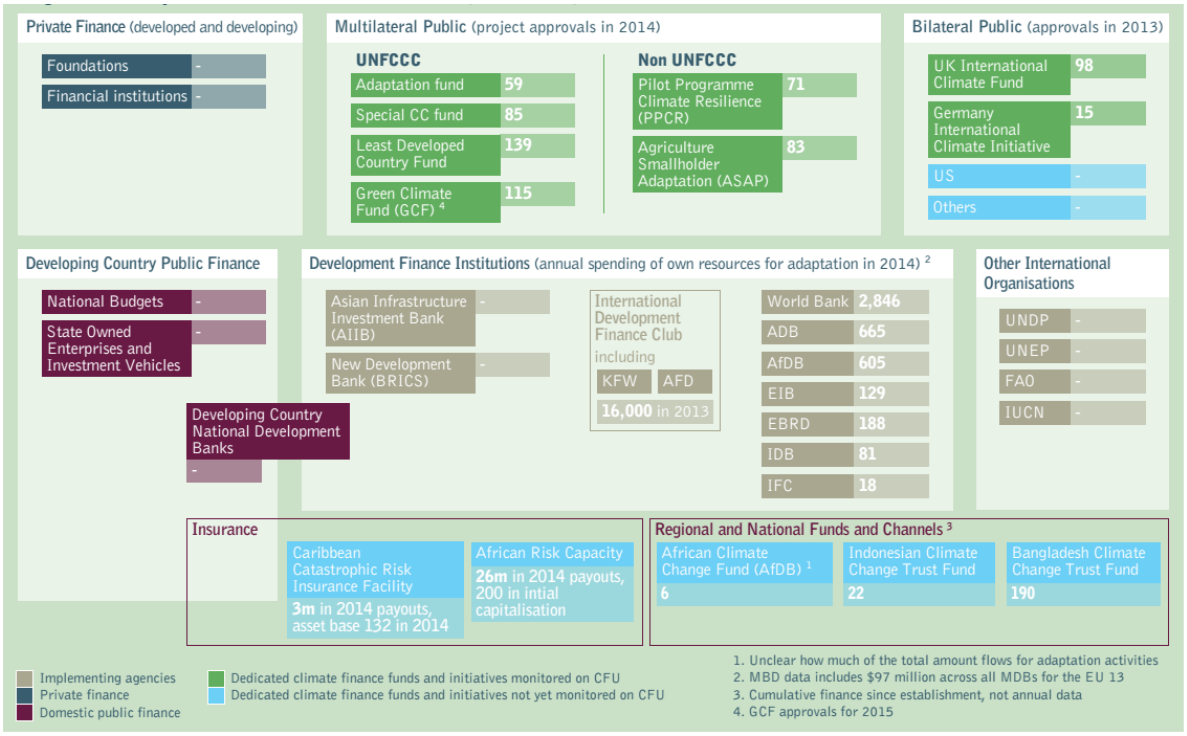
[21] OECD (2011)

[22] CPI (2015b)

[23] OECD (2015b)

[24] WRI (2015)

[25] CPI (2015a)



Adaptation finance architecture (Source: HBS North America & ODI, 2015)

1.6 **Ways for delivering climate finance**

Learning objectives: after this session you should be able to …

- Categorise examples of climate finance instruments
- Rank them by their size

Climate Finance can come in various shapes. Among the most important instruments to deliver financing are:

a) **Grants,** which are commonly used for non-revenue generating activities, such as technical assistance and capacity building, and which are largely channelled through bilateral and international financial institutions.[26] To give an example: the Nordic Climate Facility has an annual call for innovative proposals in low-income countries to receive grants.[27]

a) **Sub-commercial rate loans** with reduced interest rates, longer maturities and repayment periods, which are largely channelled through public finance institutions, such as MDBs or NDBs.[28] Mexico's EcoCasa programme, for example, has channelled more than USD 50 million in concessionary loans through a federal mortgage society, which in turn has issued concessionary loans to local housing developers.[29]

b) **Commercial rate loans**, which are usually channelled through private commercial banks**.** For example, the private sector subsidiary of the Agence Française du Développement (AFD), Proparco, provides commercial rate financing.[30]

c) **Project level equity** investments, where the investor becomes a part owner of the project depending on the size of the equity share taken in the investment. As a result, the equity investment assumes a higher risk as well as higher profit from the investment**.**[31] IFC made a USD 1.7 million equity investment in Solar Power Company's project Korat 1 in Thailand.[32]

d) **Balance sheet financing,** where finance is delivered to a direct debt or equity investment by a company or finance institution.[33]

e) **Guarantees**, which are de-risking instruments. A guarantor, in exchange for a fee, agrees to provide a guarantee in case the project fails.[34] Traded derivatives that transfer weather risks from project owners to insurance companies are a good example.[35]

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[26] EoD & IIED (2015)

[27] NDF (2009)

[28] EoD & IIED (2015)

[29] CCFLA (2014)

[30] Green Climate Fund (2015)

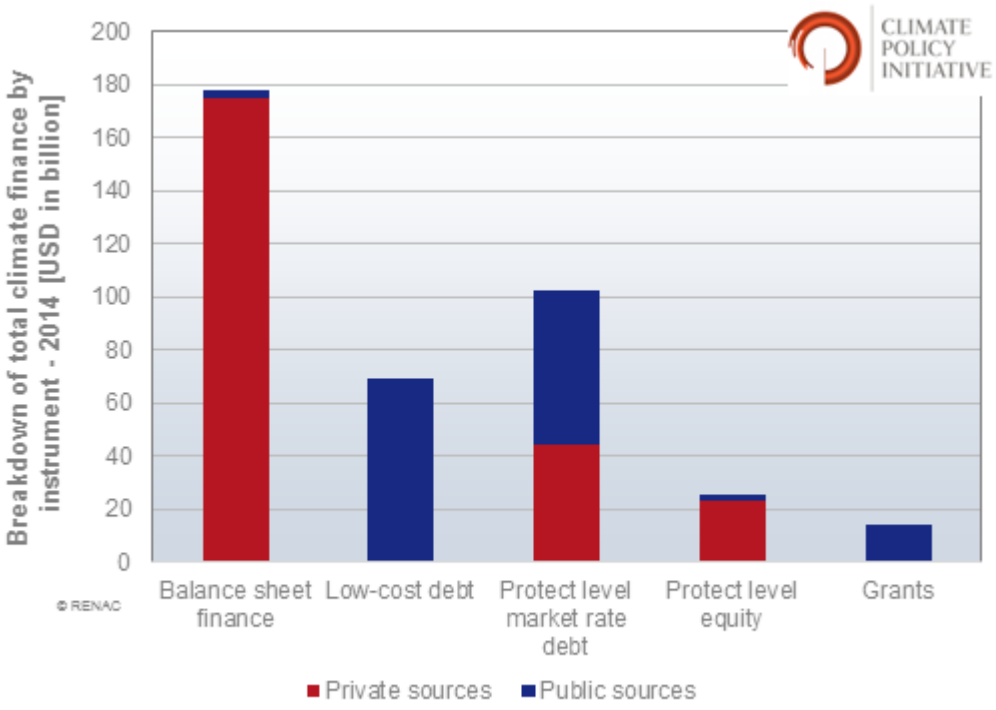
[31] EoD & IIED (2015)

[32] IFC (2011)

[33] CPI (2015b)

[34] EoD & IIED (2015)

[35] UNEP (2004)



Breakdown of total climate finance by instrument, 2012-2014, in USD billion (CPI, 2015b)

Note: CPI excludes risk management instruments from the total climate finance figure to avoid double counting between, for example, the face value of full loan guarantees and loans. Guarantees are only exercised in particular circumstances, and there might never be any outflow from the guarantor.

2 Sources and mechanisms of climate finance

2.1 Financial mechanisms of the UNFCCC

Learning objectives: after this session you should be able to …

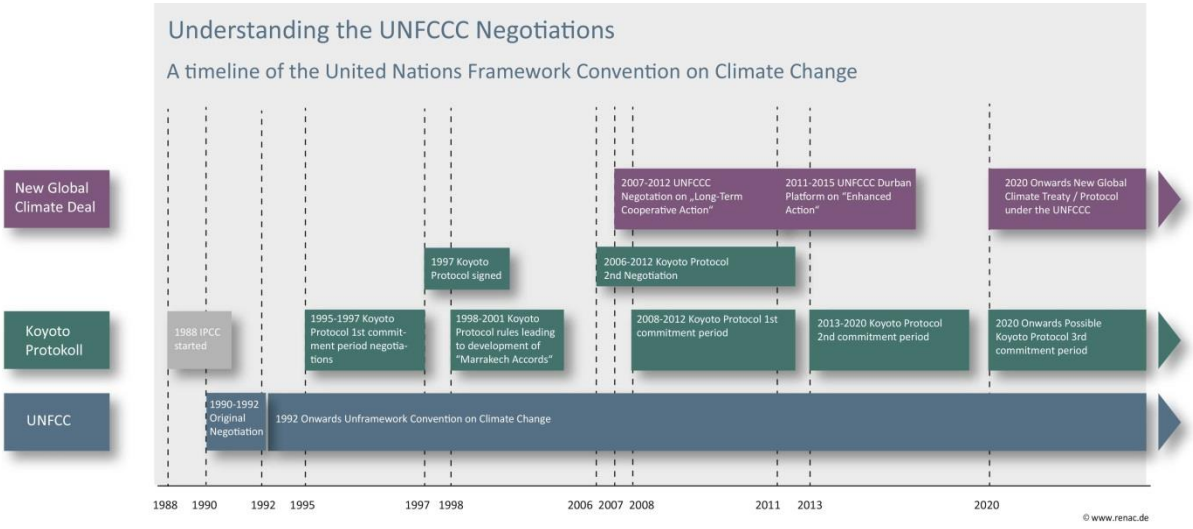
- Name milestones of the UNFCCC negotiations
- Describe the UNFCCC climate finance architecture

As discussed, climate finance has been a central element of the international climate change agreements from the outset. The UNFCCC, which was agreed in 1992, stated that developed countries should provide "new and additional financial resources" to developing countries.

In the early years, this financial assistance was channelled through the Global Environment Facility (GEF) as the Operational Entity of the financial mechanism of the UNFCCC, either directly or through dedicated funds that the GEF administers (see next page for details).

However, the GEF has been criticised for having decision-making structures that are not formally under the responsibility of the Conference of the Parties (COP) of the UNFCCC. The search for new institutional arrangements has therefore been an important aspect of the climate finance discussion. The outcome has been the creation of a new organisation, the Green Climate Fund (GCF), which will be an additional and even bigger channel through which climate finance is allocated. The GCF is headquartered in South Korea and is controlled by a Board that is directly elected by the COP.

Besides channels for public financing, the UNFCCC hosts the mechanisms of the Kyoto Protocol: the Clean Development Mechanism (CDM) and Joint Implementation (JI). These so called “Flexible Mechanisms” allow for the generation of “Certified Emission Reduction” (CER) that can be traded by companies. Another UNFCCC financing mechanism is the Adaptation Fund (a financial mechanism of the Kyoto Protocol), which is fed from a tax on CERs.



A timeline of the UNFCCC (adapted from The Climate Group, n.d.; with small changes made by author)

2.1.1 Global Environment Facility

Learning objectives: after this session you should be able to …

- Name key GEF institutions

- Describe the purpose and procedures of GEF

The Global Environment Facility (GEF) provides funds for the preservation of global environmental goods. The GEF has a Governing Council with a roughly equal representation of developed and developing countries. It reports to the COP and receives guidance from UNFCCC bodies.

Its Trust Fund is replenished about every four years. The most recent replenishment resulted in $4.43 billion available mainly for grants to developing countries. These grants cover the incremental costs of a project: for example, the additional costs of a solar energy technology over a coal power plant. This means that in climate mitigation investment, they are complemented by about four times as much investment ("co-financing") that is non-incremental (i.e. would have been necessary for the fossil alternative anyway). Overall since 1991, the GEF has provided some USD 13.5 billion in grants and leveraged some USD 65 billion in co-financing towards 3,900 projects in 167 developing countries within the areas of biological diversity, climate change, international waters, land degradation and chemicals and waste.[36]

GEF-managed funds: the GEF is the financial mechanism of several multilateral environmental agreements. In addition to the main GEF Trust Fund, the GEF also manages some of the special funds of the UNFCCC, in particular the **Least Developed Countries Fund (LDCF)** and the **Special Climate Change Fund (SCCF)**. The Adaptation Fund Secretariat is also associated with the GEF Secretariat.

GEF is largely funded through voluntary contributions from member governments, raised through replenishment negotiations that take place every four years.[37]

Access: Historically, GEF funds were accessed by the countries through Implementing Agencies. The initial set of three (World Bank, UNDP, UNEP) was broadened to 10, including other UN Organisations and MDBs. More recently, the GEF has been opened up for national organisations under the Direct Access modality (see later section for details).

The Global Climate Fund (GCF) is making steps as the new big player and currently complements many of the existing multilateral climate change funds, e.g. the Africa Climate Change Fund, the Global Environment Facility or the Adaptation Fund. Some Parties believe that it may eventually replace or subsume other funds.[38] But a consolidation of the complex and overlapping institutions is currently not planned.

2.1.2 Green Climate Fund

Learning objectives: after this session you should be able to …

- Describe the purpose of the GCF rank countries according to their pledges to GCF

Another financing mechanism under the UNFCCC is the Green Climate Fund (GCF). It is the newest actor in the multilateral climate finance architecture. It is headquartered in South Korea. Established in 2010 it became operational in 2015. It is a new financial mechanism under the UNFCCC that shall support projects, programmes, policies, and other activities in developing countries. The GCF aims to

[36] OECD (2015b)

[37] ODI (2013)

[38] Lattanzio (2014)

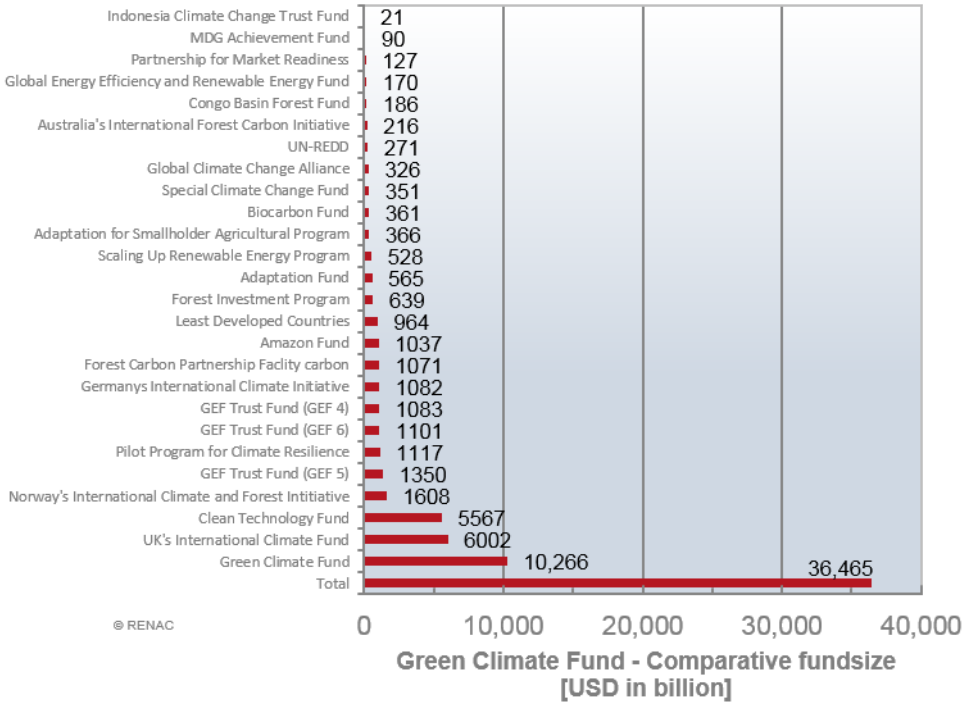
pursue a country-driven approach to low-carbon and resilient development in developing countries, and to provide funding for both climate change mitigation and adaptation.

The GCF Board has 24 members, with equal representation of developed and developing countries. The GCF has its own Secretariat. The World Bank is its interim trustee, i.e. manages the accounts. The GCF governing instrument foresees **three separate accountability mechanisms**:

- an independent evaluation unit (IEU) reporting to the Board,
- an independent integrity unit (IIU), and
- an independent redress mechanism (IRM).

GCF's initial resource mobilisation period lasts from 2015 to 2018. By 2015 countries had pledged USD 10.3 billion to the fund, exceeding the goal of USD 10 billion and making it the largest dedicated climate fund.[39] The largest contributions to the GCF signed so far came from Japan, the UK, France, Germany and Sweden.[40] The Fund accepts pledges from states, regional governments and city authorities**.**

For latest numbers please refer to: http://www.greenclimate.fund/contributions/pledge-tracker



Comparative fund sizes (Climate Funds Update, n.d.)

2.1.3 Green Climate Fund expanded

Learning objectives: after this session you should be able to …

- Recognise GCF accountability mechanisms
- Illustrate the GCF architecture
- Describe GCF characteristics

[39] WRI (2015)

[40] GCF (2016)

Countries can access the GCF both through some of the MDBs and UN agencies, as well as directly through accredited National Designated Authorities (NDA). NDAs are the interface between each developing country and the Fund and communicate the country's strategic priorities. All developing countries will have access to readiness finance – early support for "readiness activities" to build country capacity to access GCF finance. As of November 2015, 87 countries have requested readiness support from the GCF.

The GCF is the first dedicated climate fund to have a gender mainstreaming approach in place at the beginning of its funding operations.

The GCF governing instruments anticipates extensive stakeholder participation in the design, development and implementation of the strategies and activities financed by the GCF. Stakeholders are broadly defined as "private sector-actors, civil society organisations, vulnerable groups, women and indigenous peoples." Currently, 52 International Entities, 198 Civil Society Organizations (CSOs) and 45 Private Sector Organizations (PSOs) have been registered as observers to the GCF.[41]

The Private Sector Facility (PSF) is a special part of the GCF, targeting climate finance for the private sector that does not necessarily have to go through government agencies. It also operates under the guidance of the full GCF Board, but is expected to work directly with private investors. It will support activities that especially enable domestic private investment in low-carbon and climate resilient approaches.[42] Unlike the GEF, the GCF also provides loans.

NDA, National Designated Authorities

GCF architecture (GCF, n.d.)

2.1.4 Adaptation Fund

Learning objectives: after this session you should be able to …

- Give an example of an Adaptation Fund project
- Describe goals and procedures of the Adaptation Fund

[41] GCF (2016)

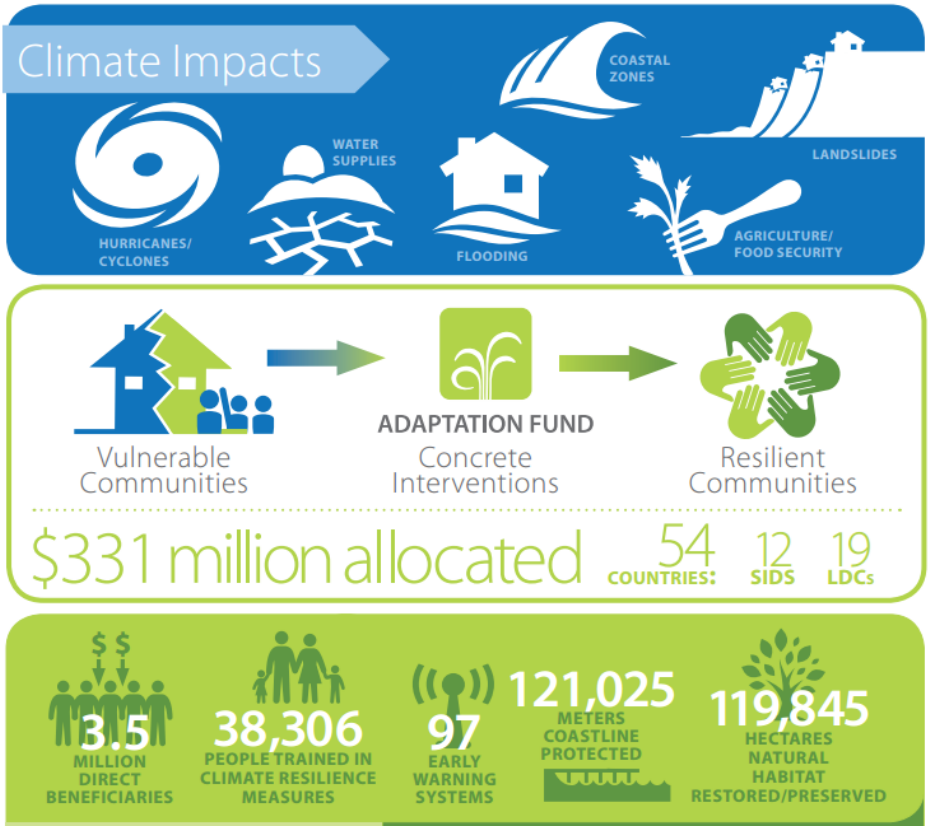
[42] Schalatek L. et al. (2015)

Mitigation activities, e.g. promoting public transport, and REDD activities, e.g. preventing emissions from bushfires, intend to cut GHG emissions. In contrast, adaptation activities aim at reducing vulnerability of communities affected by climate change, e.g. addressing future water scarcity.

The Adaptation Fund (AF) is another financing mechanism under the UNFCCC and was established in 2001 at the Seventh Conference of the Parties in Marrakech. It was officially launched in 2007 to finance adaptation projects in countries that are party to the Kyoto Protocol and most vulnerable to the impacts of climate change. The Adaptation Fund and the GCF are the only international climate funds for which the UNFCCC COP influences the composition of the Board.

The Adaptation Fund has taken on a number of innovative approaches including channelling finance through direct access modalities. As of June 2015, the fund had dedicated USD 318 million to increase climate resilience in 44 countries around the world.[43]

Financing for the Adaptation Fund comes from a 2% "tax" on the sales of certified emission reductions (CERs) issued for CDM projects and voluntary contributions from governments, the private sector and individuals.[44] However, in recent years, the sale of CERs as a revenue source has diminished because of the collapse of the global carbon market. The board of the Adaptation Fund is thus focusing on creating other funding streams, including philanthropic donations from foundations.[45]



[43] OECD (2015b)

[44] WRI (2015)

[45] EoD & IIED (2015)

The Adaptation Fund at a glance (AF, 2013)

2.2 Access to climate finance via intermediaries

Learning objectives: after this session you should be able to …

- Explain access via intermediaries for climate finance and describe the characteristics
- List potential costs as well as benefits of access through an intermediary

In the climate finance arena, there are different modalities for accessing funds for project and programme implementation.

The most common access modality is access through an implementing agency: multilateral international entities are responsible for facilitating project development, design, submitting approvals, monitoring and reporting functions on behalf of countries. Accessing funding through an intermediary implies certain costs, but also benefits for the recipient.

Advantages	**Disadvantages**
• Accessing experience and resources available from established multilateral development institutions.	• The agencies need additional staff.
• Opportunity to share lessons learned.	• Limitation of the range of options available for the countries.
• Established trust in fiduciary standards and project cycles.	• It might lengthen the time necessary to get access to the funds.
• Common understanding of monitoring and evaluation.	• The agencies have established quality control procedures and standards, including fiduciary standards and monitoring and evaluation policies

2.2.1 Direct access – summary of strengths and weaknesses

Learning objectives: after this session you should be able to …

- Indicate strengths and weaknesses of direct access
- Describe the difference between direct access and access via intermediaries
- Illustrate the architecture to gain access to the Adaptation Fund

More recently, access to financing without going through international institutions (direct access) has been made available. In direct access, project development, design and overseeing responsibilities are taken on by a national or regional entity.[46] These are directly responsible for access, disbursement and implementation of funds, and are accredited by the respective financial mechanism.[47] The country has

[46] OECD (2015b)

[47] EoD & IIED (2015)

full ownership over the use of financing.[48] The Global Environment Facility (GEF), the Green Climate Fund (GCF) and the Adaptation Fund (AF), for instance, allow direct access by accredited agencies.

For access modalities of individual funds check the website:
http://www.climatefundsupdate.org/listing

Strengths of direct access:

- …retains institutional knowledge at the country level.
- …increases the capacities of national intermediaries to manage, disburse and mobilise funds.[49]
- …has the potential to reduce the administrative costs associated with the disbursement of funds through an intermediary.
- …has the potential to influence stakeholder diversity.
- …has the potential for project innovations and expanded activities to be financed.
- …is an opportunity for South-South cooperation.
- …is transparent for the national government throughout the project cycle.

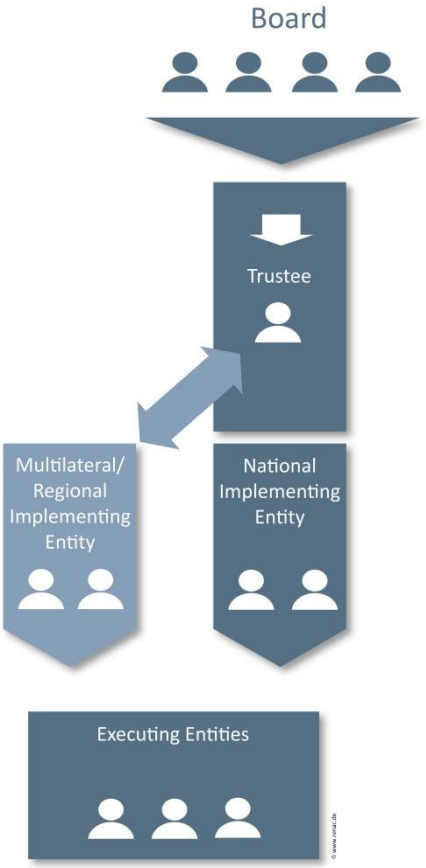
Challenges of direct access:

- Developing countries in the early stages of readiness may have difficulty in preparing their institutions to meet the conditions required for direct access. These countries may therefore need to rely on international entities to access finance in the early stages.
- To access finance directly, intermediaries need to become accredited, as in the case of the Adaptation Fund. Fiduciary standards as well as high upfront investment costs can be in the range of the actual climate grant, which can present an insurmountable obstacle to accreditation.
- Building the capacities of potential national entities may delay the move to direct access.[50]

[48] WRI (2015)

[49] EoD & IIED (2015)

[50] EoD & IIED (2015)



Modalities for accessing resources (United Nations Framework Convention on Climate Change, 2014a)

2.2.2 Direct access to the GCF

Learning objectives: after this session you should be able to …

- Describe the different steps of the accreditation as a National Implementing Entity (NIE)
- Describe the requirements NIEs need to fulfil

A National Designated Authority (NDA) or focal point is the core interface between a country and the the Green Climate Fund (the Fund). To access finance directly from the GCF, the NDA identifies and nominates national entities to be accredited as National Implementing Entities (NIEs). Any subnational, national, regional, public or private agency can apply to become accredited as an NIE to manage projects supported by the Fund. Accreditation is a process under which entities have to demonstrate that they have the ability to manage the fund's resources in accordance with the standards and criteria set out. A team of experts from the accreditation panel undertake an independent review of the application to assess whether the applicant entity meets GCF's fiduciary standards and environmental and social safeguards (ESS) and complies with its gender policy.

A NIE needs to comply with the following:

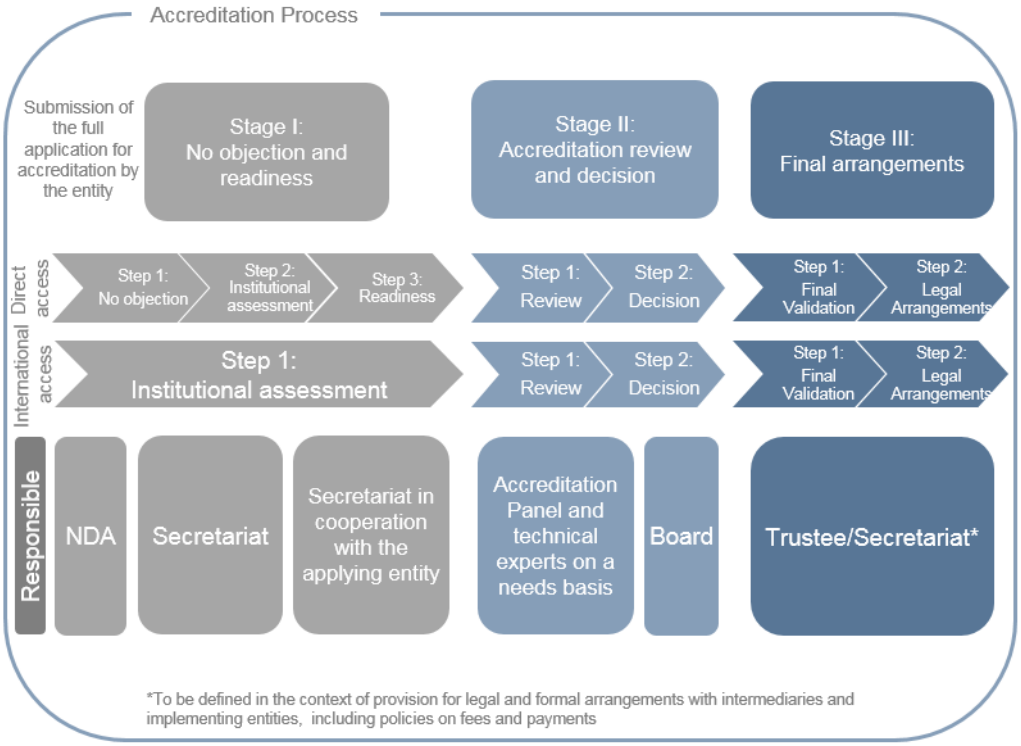
- Basic standards include key administrative capabilities, transparency and accountability.
- Specific fiduciary criteria refer to institutional capacities that will qualify applicant entities to undertake specialised activities depending on the nature and scope of their mandate within

the fund's operations. These include project management, funding mechanisms and on-lending or blending.

- Environmental and social safeguards.
- Gender policy.

There are three stages of accreditation:
(1) pre-accreditation, (2) review and decision, and (3) the final validation and legal arrangements.

Accreditation is an ongoing, interactive process. It is crucial that NIE applicants, the NDA and the GCF Secretariat/accreditation panel communicate frequently and effectively.[51]



Accreditation process (Oxford climate policy, n.d.)

2.3 **Multilateral Development Banks**

Learning objectives: after this session you should be able to …

- Name key multilateral development banks
- Rank the banks according to their resources for climate finance
- Describe the financing instruments used by the banks for climate finance

Multilateral Development Banks (MDBs) are financial entities that are jointly owned by a number of countries.

They include the World Bank, and regional development banks such as:

- the African Development Bank (AfDB),

[51] IIED (2015)

- Asian Development Bank (ADB),
- Inter-American Development Bank,
- European Bank for Reconstruction and Development, etc.

Some of the MDBs play the following roles:

- **Administering global climate funds**, e.g. the World Bank is the Administrative Unit of the Climate Investment Funds.
- **Acting as trustees to National Climate Funds**, e.g. to the Bangladesh Climate Change Resilience Fund.
- Acting as implementing entities, e.g. for funds under the Global Environment Facility (GEF).[52]
- The World Bank is also the leading manager of carbon finance facilities.
- **Banks for countries**: for instanc,e the World Bank offers concessional loans to countries and some sub-sovereign entities like utilities.

Some of the World Bank´s projects are co-financed by governments, other multilateral institutions, commercial banks, export credit agencies and private sector investors, and also by the Climate Finance mechanisms.

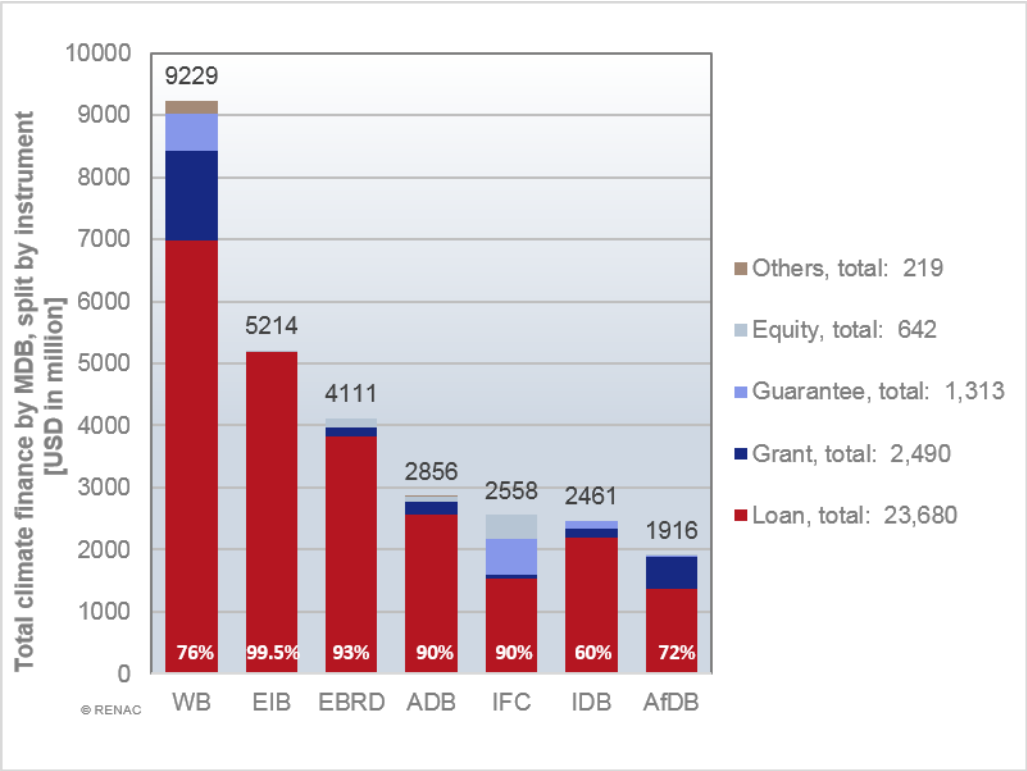
For more information, see also: http://treasury.worldbank.org/index.html

For MDBs, climate finance is an important part of their business model. In 2014 22% of the total MDB finance was climate finance.[53] Of this, about 80% was mitigation finance and less than 20% was adaptation finance. In 2014, the World Bank had by far the largest budget for climate finance with USD 9,229 million – almost a third of all MDB climate finance. In 2014, the most popular climate finance instrument of the MDBs was a loan.[54]

[52] EoD & IIED (2015)

[53] MDBs (2015)

[54] MDBs (2015)



Total climate finance by MDB, split by instrument (USD million), 2014 (MDBs, 2015)

2.3.1 Climate Investment Funds

Learning objectives: after this session you should be able to …

- Describe the work of the four Climate Investment Funds
- Explain the main aspects of the Climate Investment Funds business model

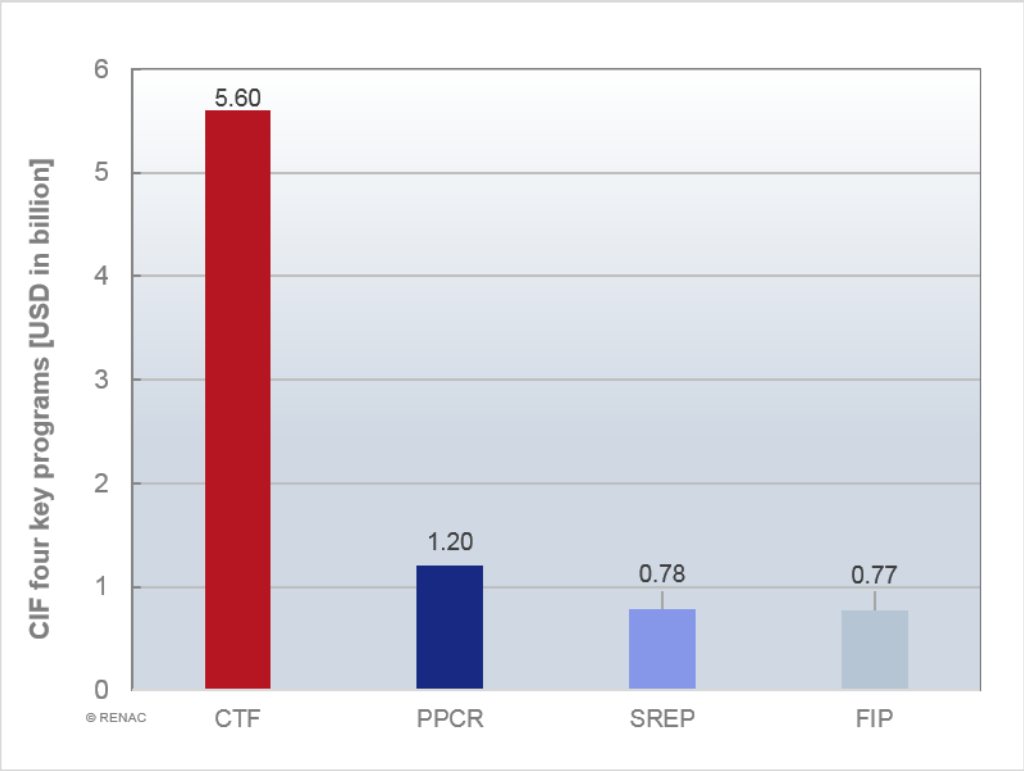
Outside of the official Operating Entities of the Financial Mechanism of the UNFCCC (GEF and GCF) a series of other climate finance mechanisms exist. The biggest among them are the Climate Investment Funds (CIFs) established in 2008. The CIF four key programs are:[55]

1. The **Clean Technology Fund (CTF)**, which provides middle-income countries with highly concessional resources to scale up the demonstration, deployment and transfer of low carbon technologies in renewable energy, energy efficiency, and sustainable transport.
2. The **Pilot Program for Climate Resilience (PPCR)**, which helps developing countries to integrate climate resilience into development planning and offers additional funding to support public and private sector investments for implementation.
3. The **Scaling up Renewable Energy in Low Income Countries Program (SREP)**, which helps to deploy renewable energy solutions for increased energy access and economic growth in the world's poorest countries.
4. The **Forest Investment Program (FIP)**, which supports efforts of developing countries in the field of REDD+.

[55] CIF (n.d.)

The CIF business model has been described as including the following elements:

- Countries develop programmatic and large-scale approaches, supported by MDBs (mostly two out of WB, ADB, AfDB, EBRD, and IADB) as implementing agencies. This should enable them to strategically plan a series of investments that mutually reinforce each other and link to other actions in priority areas, draw on the comparative strengths of different MDB partners, and benefit from MDBs' ability to leverage financing, mobilise other actors and to harmonise policy support.
- Concessional finance is used to attract private sector financing so that locally and long-term sustainable markets can develop.
- Learning by doing acts to serve as a living laboratory for climate finance, including testing and refining financing models and sharing lessons and results.



four key programs (CIF, n.d.)

2.3.2 Multilateral Development Banks/Clean Technology Fund (CTF) project example: Mexico's EcoCasa Programme

Learning objectives:

- Name an example of a Clean Technology Fund project
- Describe the barriers Mexico is facing
- Describe the idea behind Mexico's EcoCasa Programme

Mexico has an unmet housing deficit of 9 million units. EcoCasa was launched in 2013 to lead the promotion and financing for thousands of affordable energy efficient houses and technical assistance to developers in Mexico to *go green*.

For this programme, more than USD 225 million in total financing has been committed by the KfW, the Inter-American Development Bank (IADB) and the CTF. By channelling development capital through a local financial intermediary, the Sociedad Hipotecaria Federal (SHF), which offers low cost finance, Mexico's EcoCasa programme spurs investment in low-emission, climate-resilient infrastructure. It gives the market a "kick start."[56]

SHF issues loans to local housing developers that use technologies such as reflective paint, efficient gas boilers and refrigerators, solar water heaters and energy saving windows to minimise GHG emissions or to reduce water use. The SHF is moreover charged with identifying eligible developers and creates and maintains its own procedures and standards for selecting projects. The EcoCasa programme also seeks to enhance local capacity through a technical cooperation.

However, channelling development capital through local financial intermediaries is not without risks for the MDBs. Policy changes can undermine the economics of climate friendly projects – even with sub-commercial rate loans. The intermediary also needs to be able to evaluate and manage local borrowers' credit risk and offer loans accordingly.

By 2015 EcoCasa was already half way to its goal of financing 27,600 sustainable homes and 600 passive houses by 2019. Achieving this goal would prevent a total of 1 million tonnes of CO_2e.[57]

Energy efficient houses in Mexico (EcoCasa, as found at Developingsmartcities (2015))

[56] Developingsmartcities (2015)

[57] Cities Climate Finance Leadership Alliance (CCFLA) (2015)

2.4 Bilateral finance

Learning objectives:

- Describe the principles of bilateral finance
- Name bilateral finance sources (in association with their countries) and examples of bilateral finance activities

Apart from MDBs there are also bilateral development institutions (BDIs). Bilaterals provide ODA finance supported from developed country budgets. These institutions commonly provide some combination of debt and equity investment, guarantees and technical assistance on a variety of terms, ranging from grants to market rates.[58]

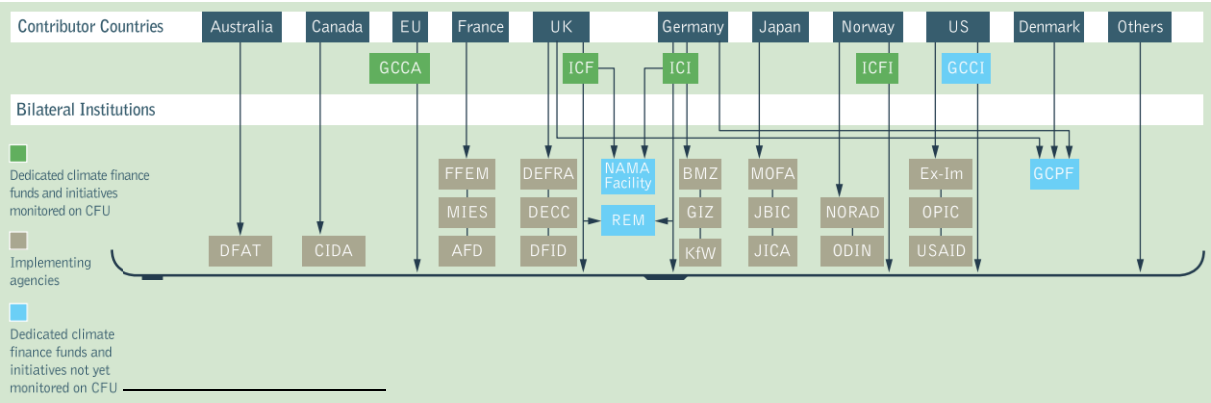
Examples of BDIs are the UK's DFID, Germany's KfW Development Bank and GIZ, the French Development Agency (AFD), Danida, and the Japan International Cooperation Agency (JICA).

Examples of bilateral funds are the UK's International Climate Fund (ICF – USD 6 billion total pledged for the period 2016-2021), Norway's International Climate Forest Initiative (NICFI – USD 1.6 billion pledged, forestry only), and Germany's International Climate Initiative (IKI).

The ICF is the primary channel of UK climate change finance. A private sector example is the Climate Public Private Partnership Programme (CP3). It is investing GBP £110 million in two commercially run private equity funds which will pick the best investments (both direct investments and sub funds) in sectors such as water, renewable energy, energy efficiency, low carbon transport and clean technology.[59]

By 2012, NICFI had approved USD 305 million through bilateral channels. Sizeable pledges have been made for REDD+ activities in Brazil, Indonesia, Tanzania and Guyana.[60]

Germany's IKI with a 2013 budget of almost EUR €2 billion is partially funded through the sale of emission certificates.[61] One project example is GenderCC,[62] a project that will work with organisations in India, Indonesia and South Africa to integrate social and gender issues into urban climate policy. Activities include training of "gender and climate change promoters" in pilot cities, the development of training materials and an e-learning course.



[58] WIR (2013)

[59] UK Gov (2015)

[60] HBS (2015b)

[61] IKI (n.d.-b)

[62] IKI (n.d.)

Global climate finance architecture diagram (HBS & ODI, 2015)

2.5 **Domestic climate financing sources**

Learning objectives: after this session you should be able to …

- Associate certain environmental policy goals with adequate policy tools
- Define the benefits of raising domestic revenue
- Identify and categorise sources for domestic climate financing
- Describe which sources improve the overall market and trigger climate friendly behaviour

In addition to the international sources, states can also set-up and use domestic sources for climate finance.

National or energy utility budget constraints can be a severe barrier to making financing available for low-carbon, climate resilience development.

Possible sources for increased domestic revenues to channel into climate finance ideally improve the overall market conditions for mitigation and adaptation technologies and trigger climate friendly, as well as resilient, behaviour.

<u>Increased public revenue:</u>

- Carbon taxes/carbon trading schemes/emission trading systems (ETS) (see figure below).
- Energy or vehicle taxes
- Congestion charges, highway and airport levies
- Levies on waste, charges on fertilizers
- Environmental fines and fees

<u>Trading systems:</u>

- Credit trading of adaptation measures

<u>Redirection of public expenditures:</u>

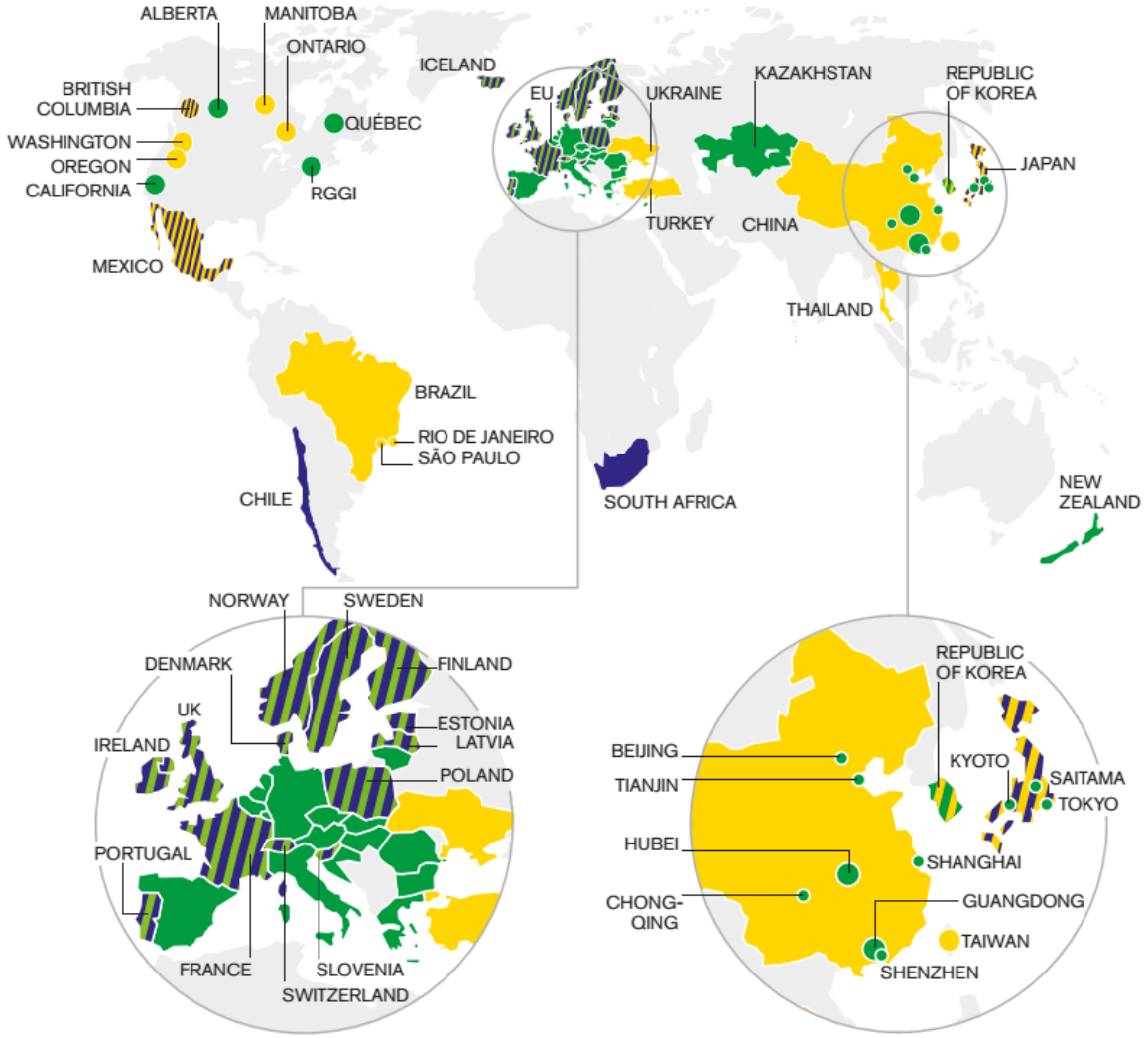
- Reduction of fossil fuel/electricity subsidies
- Healthcare savings

Currently, about 40 national jurisdictions and over 20 cities, states and regions – representing almost a quarter of GHG emissions – are putting a price on carbon (see figure below).

One example of a trading system is the Stormwater Retention Credit Trading Program in Washington DC. In 2014, the District launched the Program with the goal of protecting waterways and making the city more resilient to climate change. Under a new credit trading facility, participants receive storm water retention credits (SRCs) for exceeding regulatory requirements or making voluntary investments

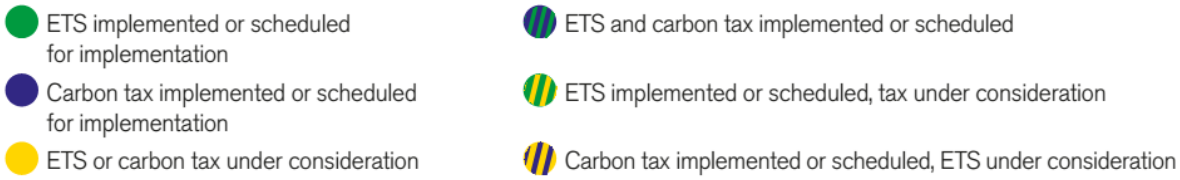
in green roofs or rain gardens. All new development projects permitted after January 2014 must meet standards for storm water retention or must buy SRCs from unregulated properties in the city.[63]

An example of redirecting new public revenue streams to green infrastructure are the congestion charge levies introduced in London, Stockholm and other cities to reduce car use and air pollution.[64]



[63] CCFLA (2015)

[64] CCFLA (2015)



Note: The circles represent subnational jurisdictions. The circles are not representative of the size of the carbon pricing instrument, but show the subnational regions (large circles) and cities (small circles). Carbon pricing instruments are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date.

Overview of existing, emerging and potential regional, national and subnational carbon pricing instruments (ETS and tax) (Ecofys/World Bank, 2015)

2.5.1 Energy subsidy reform

Learning objectives: after this session you should be able to …

- Provide reasons for and explain the benefits of an energy subsidy reform
- Characterise the elements of a successful energy subsidy reform

The IEA estimates indicate that fossil fuel consumption subsidies worldwide amounted to USD 493 billion in 2014. The WEO 2015 Database[65] lists 45 countries applying fossil fuel subsidies. Those subsidies were over four-times the value of subsidies to renewable energy. It is conceivable to combine climate finance with energy subsidy reform. Energy subsidy reforms have two major disadvantages:

(1) Subsidies put a burden on the public budget: globally, energy subsidies – including the failure to internalise the cost of carbon emissions – are estimated to be around USD 5.3 trillion, or 6.5% of global GDP.[66]

(2) Fossil fuel subsidies prevent low-carbon technologies and efficiency from entering the market: removing these subsidies could reduce CO_2 emissions by 20% and deaths related to fossil fuel emissions by over 50%.[67]

Even though it is frequently argued that energy subsidies were applied to benefit the poor, less than 10% of energy subsidies benefit the lowest fifth of the earnings pyramid, with over 40% going to the top fifth.

Common elements for a successful energy subsidy reform are:

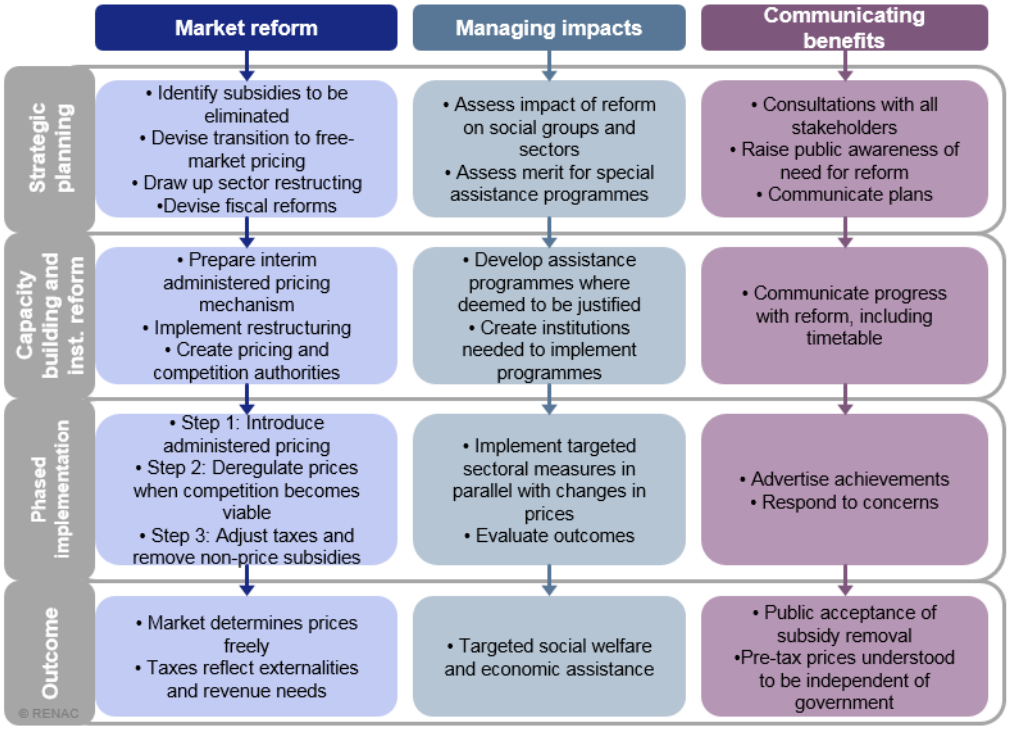
- **Get the prices right** – prices should reflect the full economic costs with reference to international market prices, or in the case of electricity to cover fuel inputs, transmission and distribution as well as return on the utilities' capital investments.

[65] IEA(2015b)

[66] IMF (2015)

[67] IMF(2015)

- **Step-by-step –** subsidy reforms should typically be introduced in small steps. To de-politicise the process, an independent body should be set-up to oversee energy pricing.
- **Manage the effects –** in parallel to the reform, vulnerable groups, such as the poorest households, might receive protection, e.g. conditional cash transfers; but the effectiveness of such measures must be regularly monitored and evaluated. A combination with energy efficiency can help limit negative impacts.
- **Consult and communicate at all stages –** to convince citizens of the need for reform and the justice of its implementation.[68]



Critical steps of a process to reform fossil fuel subsidies (IEA based on Beaton et al., 2013)

2.5.2 National climate funds

Learning objectives: after this session you should be able to …

- Describe the merging options of different climate finance sources
- Distinguish between multilateral and national funds

[68] IEA (2015a)

The establishment of national climate funds can be a useful instrument for making government budgetary funds available and to potentially complementing them by pooling finance from various sources at the national and international levels. Examples of such initiatives are. the Congo Basin Forest Fund, the Philippines People's Survival Fund, Guyana REDD+ Investment Fund or the Amazon Fund.

In 2005, Tunisia created a National Fund for Energy Conservation to support renewable energy and energy efficiency initiatives. The fund was to be supported through tax revenues from motor vehicle registrations and customs duties on air conditioning systems.[69]

In response to climate finance streams from developed to developing countries there is a push by developing countries for more direct access to funds without having to go through international institutions and so being subject to their rules and conditions. Therefore, in addition to channelling domestic revenues into national funds, many countries are setting up special national funds to secure direct access.[70]

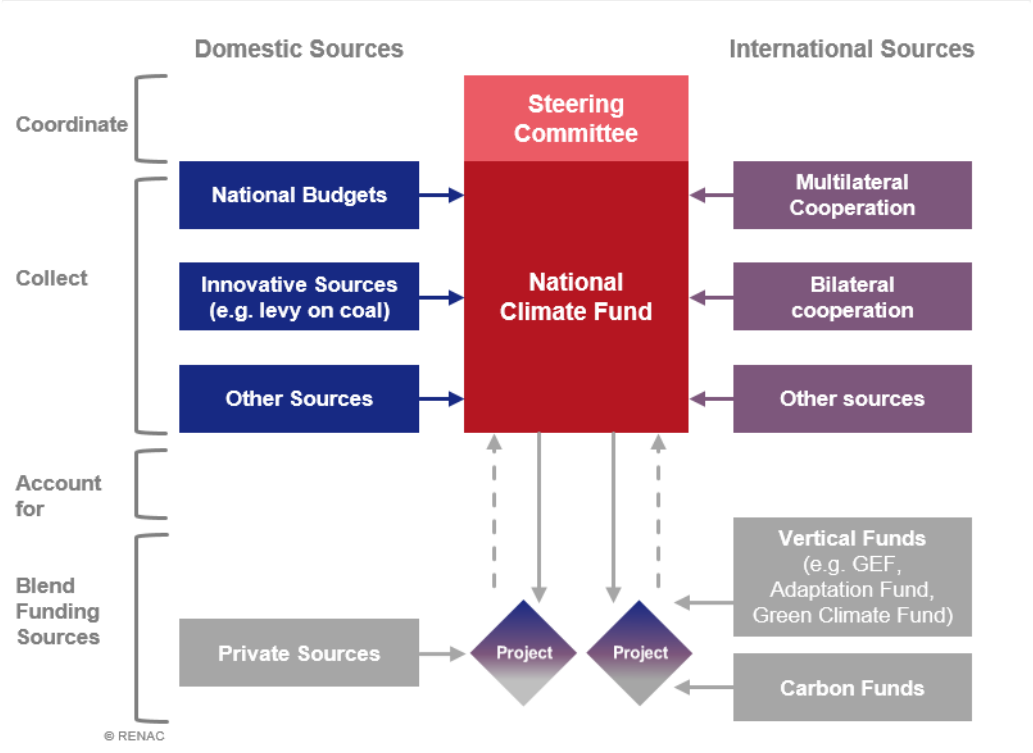
The Indonesia Climate Change Trust Fund (ICCTF), for example, intends to link international finance sources with national investment strategies. The ICCTF is entirely country driven, with all funding decisions devolved to the country level. Currently, UNDP still acts as interim Trustee. The ICCTF receives non-refundable contributions from bilateral donors: the UK, Sweden and Australia.[71] The main funding mechanism of the ICCTF is the "Innovation Fund", which provides grants to line ministries to support climate change related projects within the government. ICCTF has three priority funding windows: energy and energy efficiency, sustainable forestry and peat land management, and resilience.

Developed countries also have such funds. In 2010, the German government established a separate budget structure, the "Energie- und Klimafonds", to finance national and international climate related expenditures. This fund receives all German revenues from the EU ETS auctions. It finances the "International Climate Initiative" (IKI), its national counterpart (NKI), a large concessional loan programme for energy retrofits in buildings and many other energy efficiency and climate related expenditures.

[69] Trabacchi C. et al. (2012)

[70] Fankhauser S. (2014)

[71] Climate Funds Update (2009)



National climate funds as part of the international climate finance landscape (UNDP, 2011)

2.6 **Private financing in climate finance**

Learning objectives: after this session you should be able to …

- Classify private finance actors
- Explain signs of a shift in private investment towards climate finance

Private investors include large investors, banks, insurances and pension funds but also private citizens. Private investors can engage in climate finance in different ways, including direct investments or product development, and are in fact the most important source and users of climate finance.

In 2014 private actors invested USD 243 billion in renewable energies alone. In the same time, total public climate finance contributed only USD 148 billion.

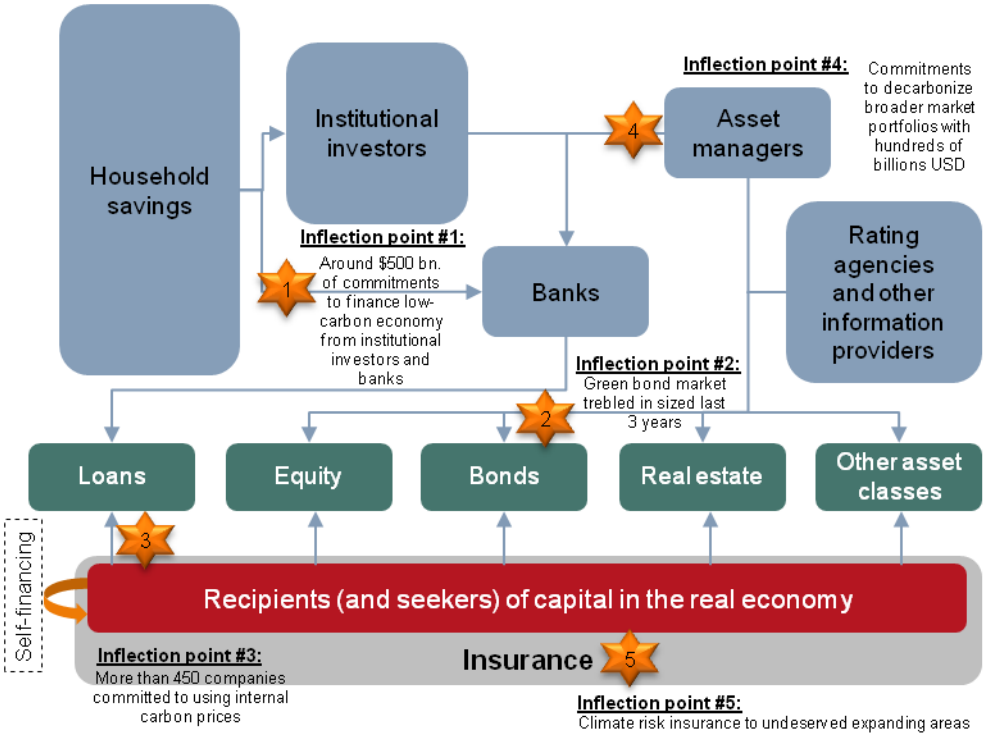
An important stream of international private climate finance is triggered by emissions trading systems (ETS), which will be discussed in more detail on one of the next pages.

The commitment to developing countries to provide USD 100 billion annually includes public, private and innovative sources. The problem of this "commitment" is that developed countries must specify whether and how they can guarantee that only private investments would be counted which have been demonstrably mobilised by virtue of the effort of developed countries, instead of counting business as usual investments. [72]

[72] Oxfam (2012)

A UN report on Private Sector Climate Finance[73] identifies the following **early signs of a deep shift in private investment towards climate finance**:

1. Inflection Point #1: a range of financial institutions have committed hundreds of billions of finance to support low-carbon and climate resilient investments.
2. Inflection Point #2 A new green bond market has been created and is expanding rapidly.
3. Inflection Point #3: An increasing number of companies are adopting internal carbon prices. Inflection Point #4: Investors are expressing concerns of carbon intensive assets. Initiatives such as the Portfolio Decarbonisation Coalition drive commitments to decarbonise market portfolios.
4. Inflection Point #5: The insurance sector is scaling up its efforts to respond to climate impacts.



Across the finance ecosystem there are early signs of a fundamental shift (CCST, 2015)

[73] Eis J., Ward J. (2015)

2.6.1 Export Credit Agencies (ECAs) and export credits in climate finance

Learning objectives: after this session you should be able to …

- Define what Export Credit Agencies are
- Distinguish between UNFCCC climate finance mechanisms, multilateral development finance institutions, export credit agencies and national climate funds
- Assess the role of ECAs in tackling climate change

A general mechanism for supporting private investment are export credits. Export Credit Agencies (ECAs) are public institutions whose primary aim is to support exporters and investors doing business overseas. The majority of this financing takes the form of guarantees and political risk insurance, by which the institution commits to cover exporter or investor losses in the event of foreign political or commercial upheaval.[74]

During the 1990s, ECAs averaged roughly twice the levels of ODA provided during the same time, therefore their role and impact on developing countries is very important.[75]

Developed countries mobilised between 2013-14 USD 1.6 billion annually of climate finance via export credits (3% of the total) for developing countries.[76] In addition, it is also important to stop financing climate harming investments.[77] The amount of finance provided for harmful projects still outweighs climate finance: according to data compiled by the Natural Resources Defence Council (NRDC), ECAs from OECD countries provided in 2013 more than USD 8 billion for coal projects.[78] 47% of the total international finance for coal came through OECD Export Credit Agencies. First the US and France have committed – with some exemptions – to end their export credits for coal plants overseas.[79] By the end of 2015 the OECD decided to restrict – but not to eliminate – export financing to build coal power plants overseas.[80]

[74] WRI (2013)

[75] UNEP (n.d.)

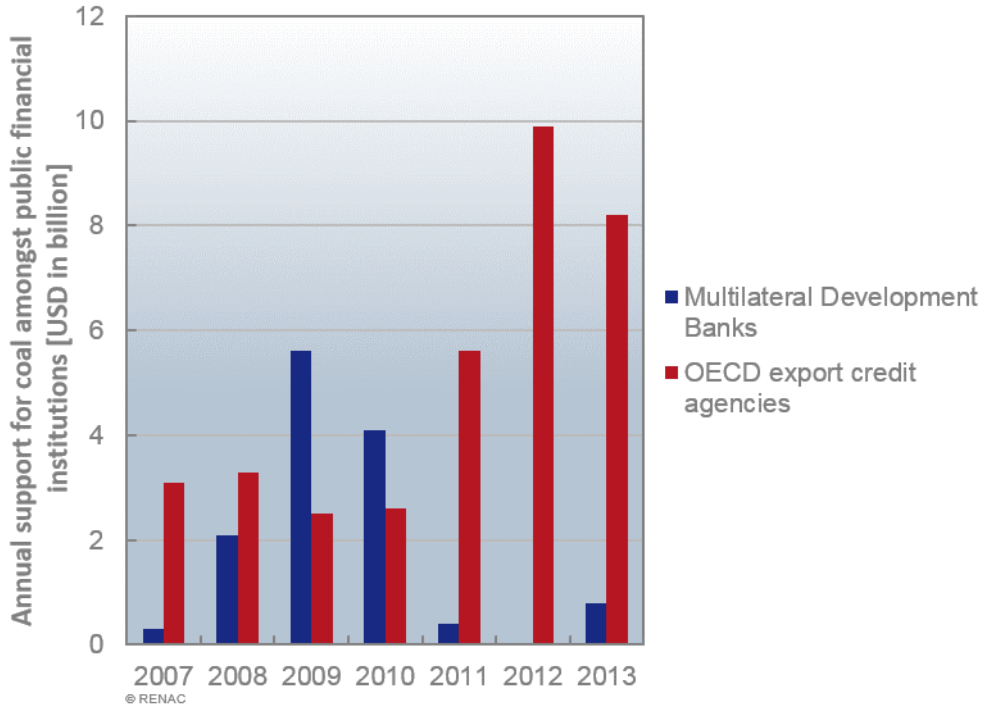
[76] OECD (2015a)

[77] ECA Watch (n.d.)

[78] NRDC (forthcomming)

[79] WWF (2015)

[80] The Guardian (2015b)



Annual support for coal amongst public financial institutions 2007-2013 (USD billion) (NRDC (forthcoming) in ECA Watch et al. (2014)

2.6.2 Examples of innovative climate financing mechanisms

Learning objectives: after this session you should be able to …

- Give examples of innovative financing mechanisms
- Describe YieldCos

It is generally agreed that the challenges posed by climate change need to be addressed by new financing instruments such as YieldCos, insurance models and crowdfunding.

A **YieldCo** is a **publicly traded investment fund structure** that owns cash generating infrastructure assets, which generally earn stable cash flows. Most notably, the YieldCo collects the stable cash flows and distributes them through public markets to shareholders as dividends while providing liquidity. YieldCos can also issue green bonds.[81] The 15 US and European YieldCos grew in value from USD 12 billion in 2013 to more than USD 20 billion in 2015.[82]

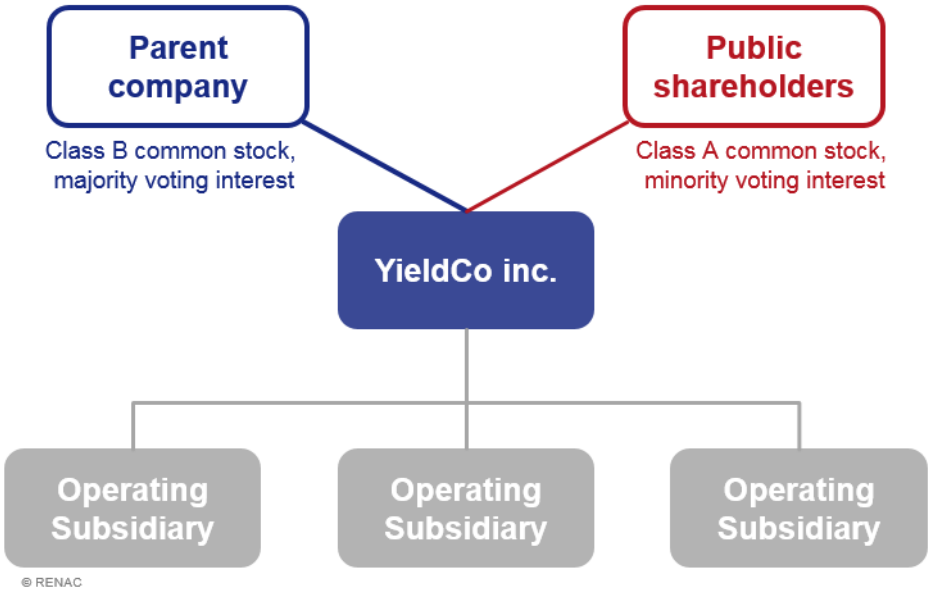
The Global Innovation Lab for Climate Finance is testing and promoting innovative instrument ideas such as the **Energy Savings Insurance** that addresses the lack of trust of local banks in energy efficiency pay back. The insurance pays out if the projected value of energy savings is not met.[83] The Lab's analysis shows that the instrument can absorb up to 80% of this underperformance risk of energy efficiency projects. Other project ideas can be found on the Lab's website http://climatefinancelab.org

[81] OECD (2015d)

[82] Bloomberg New Energy Finance (BNEF) (2015c)

[83] The Lab (n.d.)

CITIZENERGY is an EU online platform that brings together **renewable energy crowdfunding platforms and cooperatives** from across Europe in one space. It offers EU citizens the opportunity to invest in renewable energy projects across Europe. The platform can be found here: https://citizenergy.eu/citizenergy/site/view-project?e=e7s1&i=9



Structure of a YieldCo (made by author)

2.6.3 Examples of innovative climate financing mechanisms expanded

Learning objectives: after this session you should be able to …

- Describe green bonds
- Name the largest markets for green bonds

Another example of an innovative mechanism for climate finance is green bonds.

A bond is a form of debt security, which is a legal contract for money owed that can be bought and sold between parties. Investors in bonds become creditors and are paid a fixed interest rate. **Green bonds are issued to raise capital specifically to support environmental projects.**[84] Like conventional bonds, they can be issued by a corporate, bank or government entity. Institutional investors are often seen as natural buyers of green bonds, given their appetite for investment in low-risk, fixed-income products with long-term maturities that match their long-term liabilities. In 2014, the market issued USD 36.6 billion in green bonds. The market of climate aligned bonds also includes **unlabelled bonds whose proceeds are used to finance climate solutions but do not carry the green label**. The total universe of climate aligned and green bonds outstanding was estimated to be USD 600 billion per June 2015.[85] China (33%) and the US (12%) are the biggest markets.

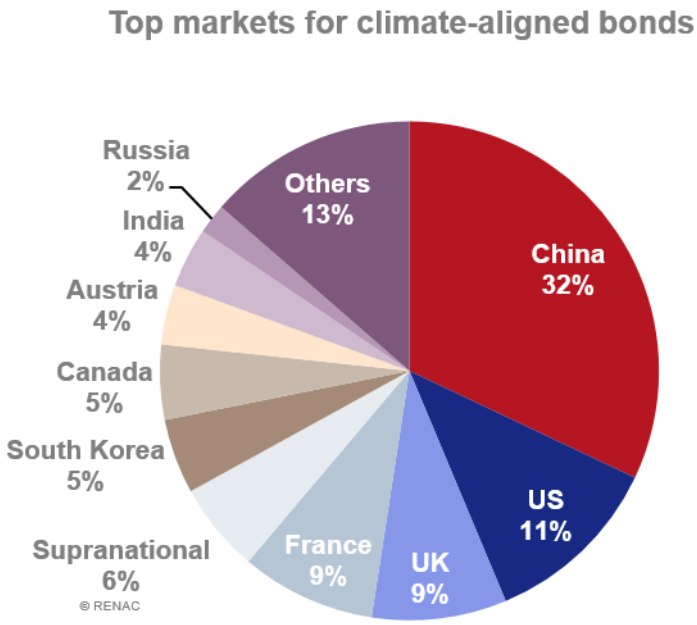
Project bonds are a specific and relatively **small subset of the larger green bond market**. Project bonds provide a means for project developers to attract long-term debt financing, by creating a special purpose vehicle. Based on an assessment of the financial viability of the underlying projects, a credit rating can be secured for the vehicle, and if it is sufficiently high, bonds are issued. Bond finance raised through these means can be cheaper than commercial loans.

A good starting point to get familiar with green bonds is the material of the Climate Bonds Initiative, including its report **'Bonds & Climate Change: State of the Market 2016'** or blog http://www.climatebonds.net/resources/overview/climate-bonds-for-beginners

CBI also provides a list of green bonds: http://www.climatebonds.net/cbi/pub/data/bonds

[84] World Bank Treasury (2009)

[85] Climate Bonds Initiative (2015)



Top markets for climate aligned bonds (Climate Bonds Initiative, 2015)

2.6.4 Clean Development Mechanism

Learning objectives: after this session you should be able to …

- Explain principles of the CDM and JI mechanisms
- Identify key phases in the market development of EUA and CER prices
- Distinguish between offsetting mechanisms and cap-and-trade systems

The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) established a cap-and-trade system that imposes national caps on the GHG emissions of developed countries that have ratified the Protocol (called Annex B countries). Each participating country is assigned an emissions target and the corresponding number of allowances – called Assigned Amount Units, or AAUs.[86]

Emission reductions occur when the equivalent of one metric tonne of GHGs is prevented from entering the atmosphere via a coordinated activity. This reduction is verified under the Kyoto Protocol's Clean Development Mechanism (CDM) and the Joint Implementation (JI) mechanisms as a Certified Emission Reduction (CER).

The CDM and JI are based on the idea that lowering GHG emissions can be done at a lower cost in developing or transition countries than in advanced economies.[87]

By the end of 2014, the CDM had transferred around USD 90 billion to developing countries and had financed approximately 13% of the total renewable energy (RE) investment in these countries. Joint

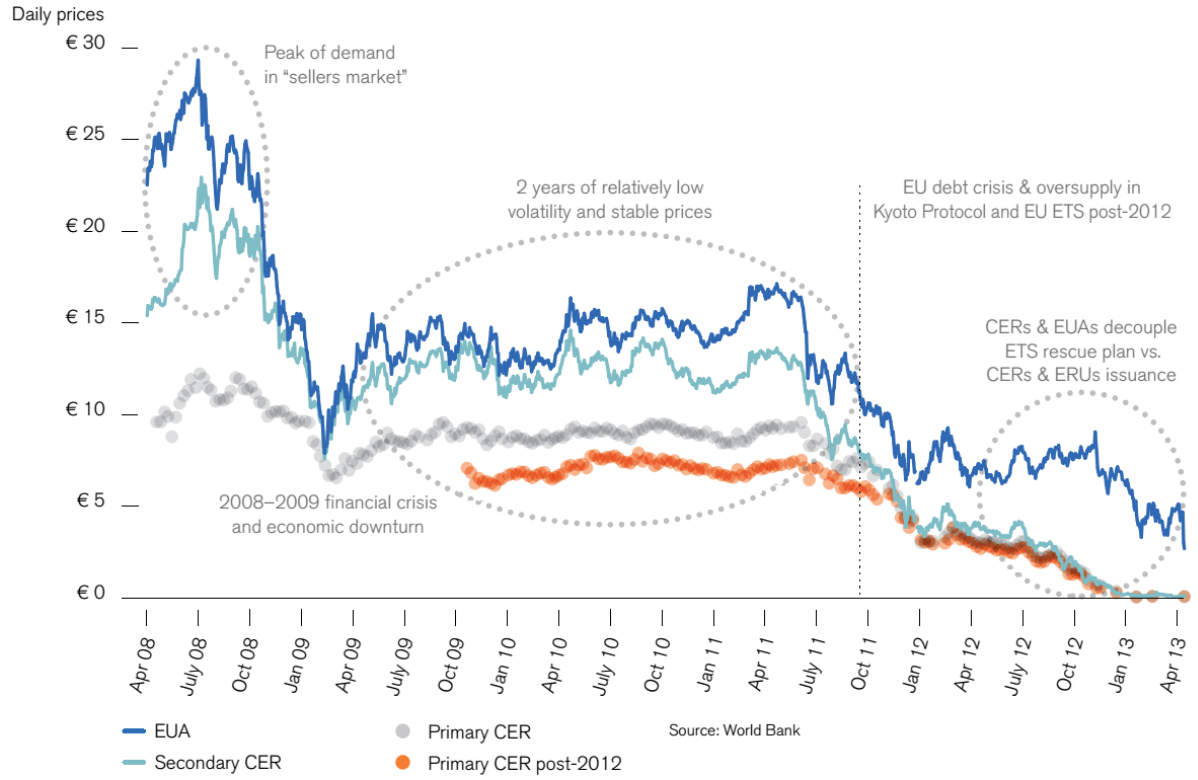
[86] Carbon Market Watch (n.d.-c)

[87] Brettonwoods Project (2011)

Implementation (JI) was created to enable developed countries to host offset projects. Until 2015, almost 900 million carbon credits were issued under the JI.[88]

The EU started its Emissions Trading System (EU ETS) in 2005, California's ETS came into effect in 2013. Frequently, these systems allow for offsets via CDM or JI projects. EU installations are the most important buyers of CDM credits. Up to 50% of the EU-wide reductions over the period 2008-2020 can be achieved by buying CDM and JI offsets. To date, EU ETS installations have used 1.45 $GtCO_2e$ of CERs and Emission Reduction Units (ERUs) to help them meet their compliance obligations.

With the price collapse of Emission Unit Allowances (EUAs) since 2008 CDM prices have plunged. The average CER price on the secondary market was €0.17/tCO2e (USD 0.19) in 2014.[89] Since EU installations have almost exhausted their Kyoto quota CER sellers will be losing an important client. The current low EUA prices lead to split views concerning the ETS's effectiveness as a policy instrument and the consequences for long-term investments.[90]



EUA - European Emission Allowances, CER – Certified Emission Reductions

EUA and CER prices (2008–2013) (Carbon Finance/Ecofys, 2013)

[88] SEI (2015)

[89] Ecofys & World Bank (2015)

[90] Ecofys & Carbon Finance (2013) Carbon Finance/Ecofys (2013) Mapping Carbon Pricing Initiatives. https://www.thepmr.org/system/files/documents/Mapping%20Carbon%20Pricing%20Initiatives-%20Developments%20and%20Prospects.pdf

2.6.5 Voluntary carbon offsets – coverage and actors

Learning objectives: after this session you should be able to …

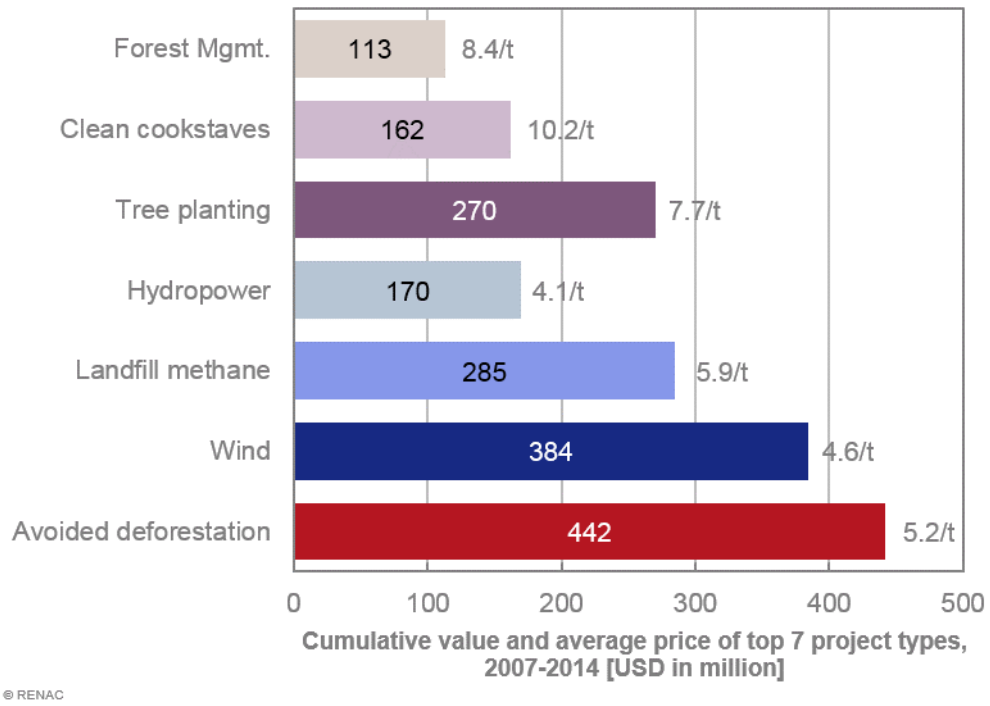
- Describe voluntary carbon markets
- Give examples of voluntary carbon offset certification schemes

Carbon pricing is currently in place in 38 jurisdictions according to the World Bank, encompassing both carbon taxes and emissions trading systems (ETS).[91] Beyond – or in the absence of – existing regulations voluntary carbon offsets offer the opportunity to voluntarily buy carbon offsets to take responsibility for neutralising caused emissions. Buyers of voluntary carbon offsets (of which 95% are companies and individuals) buy such credits mainly for PR and/or idealistic reasons, such as corporate social responsibility (CSR) activities, to demonstrate climate leadership or because they have a climate-driven mission.

The vast majority of voluntary carbon projects now use third party verified standards to guide project development and to ensure that emission reductions are real and "additional" – meaning that the reduction would not have been achieved without carbon finance. In 2014, the most important verification standards were the Verified Carbon Standard (VCS) (http://www.v-c-s.org/), American Carbon Registry (ACR) (http://americancarbonregistry.org/), Climate Action Reserve (CAR) (http://www.climateactionreserve.org/) and the Gold Standard (http://www.goldstandard.org/).

Voluntary buyers have spent nearly USD 4.5 billion to offset over the last decade and transacted nearly 1 billion tonnes of emissions. Projects that avoid deforestation are the top-selling offset project type. The second bestselling type is wind energy (see figure below).

Prices for voluntary offsets are falling as supply vastly exceeds demand. The average price of voluntary carbon offsets in 2014 reached an all-time low of USD 3.8.[92]



[91] C2ES (2016)

[92] Hamrick & Goldstein, 2015

Notes: Based on 412 MtCO2e in transacted offsets associated with a project type, 2007-2014.
Source: Forest Trends' Ecosystem Marketplace. *State of the Voluntary Carbon Markets 2015*.

Cumulative value and average price of top 7 project types, 2007-2014 (Hamrick & Goldstein, 2015)

2.6.6 Critical voices on offsetting mechanisms

Learning objectives: after this session you should be able to …

- Explain major points of criticism of offsetting mechanisms
- Name criticism raised against the CDM

The two major points of criticism against offsetting mechanisms are that:

1. cap and trade systems (where a "cap" limits emissions and accordingly allocates allowances to companies, and "trade" creates a market for carbon allowances, helping companies to meet their allocated limit[93]) have not created a stable environment for climate friendly investment, and
2. the offsets have to a large extent not been additional to that which would have been carried out, and in fact have added to overall emissions rather than reducing them.

Regarding the first criticism: EU ETS installations have been the largest buyers of CERs. With the collapse of EUA prices, CER prices dropped dramatically to EUR €0.17/tCO_2e (USD 0.19) by 2014.[94] Due to low prices, many CDM projects are under threat of discontinuity. CERs are priced significantly lower than the carbon tax or allowances under domestic instruments. The price collapse of CERs has led to question the effectiveness of CDM and market-based emissions reduction systems in general.

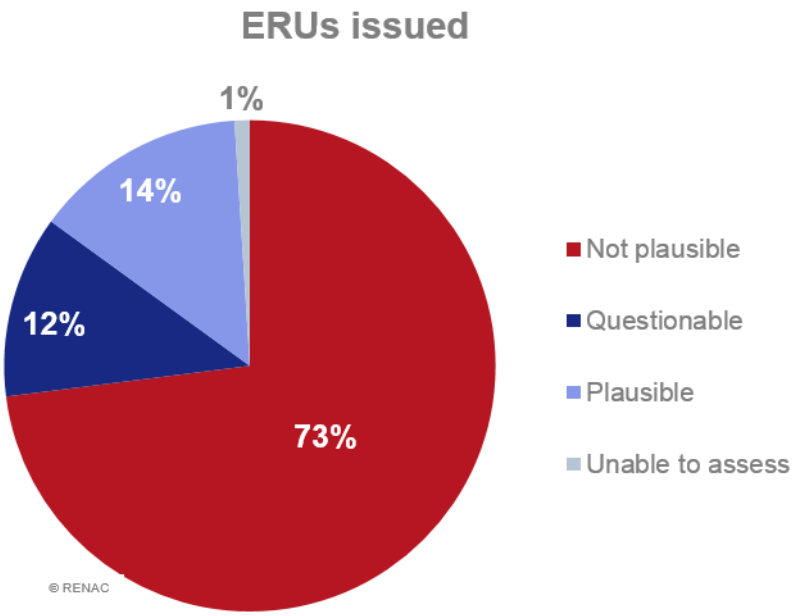
Regarding the second criticism: a series of NGOs, such as Carbon Market Watch, stresses that CDMs do not have climate benefits because "*research shows that because of the lenient rules used for CDM projects, up to 60% of carbon credits (…) may not represent real emissions reduction*."[95] Furthermore, "*there is little evidence*" of sustainability benefits but rather that "*some CDM projects have actually caused significant harm to local populations*".[96] The figure below shows that in a plausibility assessment of JI projects, 73% of Emission Reduction Units (ERUs) issued were considered not to be additional, which means that the project would have been carried out irrespective of the CDM mechanisms.

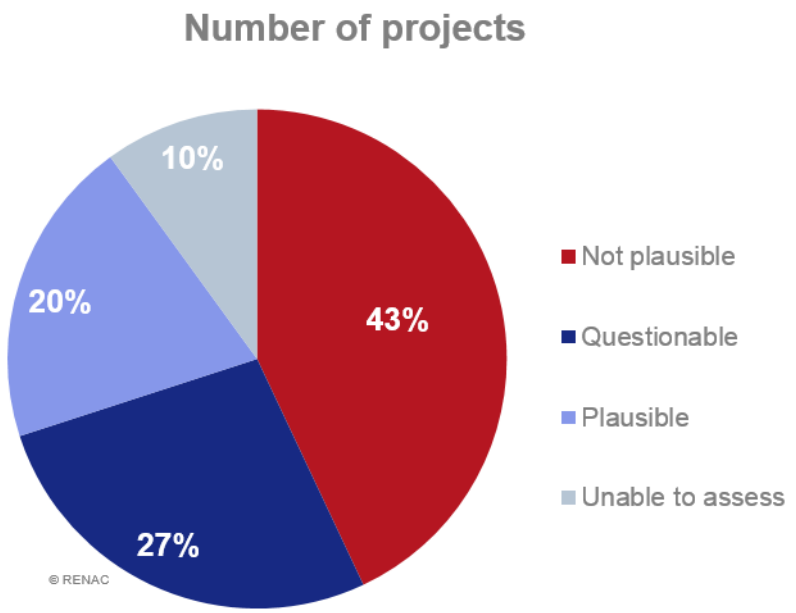
[93] Environmental Defense Fund (n.d.)

[94] Ecofys/World Bank (2015)

[95] Carbon Market Watch (2014)

[96] Carbon Market Watch (n.d.)





Plausibility of the additionality claims of the sample JI projects (Kollmuss et al., 2015)

2.7 **Carbon initiatives**

Learning objectives: after this session you should be able to …

- Describe the World Bank's role in carbon finance

- Name different carbon funds of the World Bank

The World Bank Carbon Finance Unit uses funds contributed by OECD governments to purchase project based GHG reductions (CDM or JI credits) in developing countries and countries with economies in transition.

The figure below shows how carbon funds (with the World Bank acting as the trustee) purchases emission reductions on behalf of donor governments or companies from project developers. Governments can either retire the credits or use them to fulfil their emission reduction obligations.

The World Bank is the trustee of a series of carbon initiatives[97]:

Carbon Trusts:

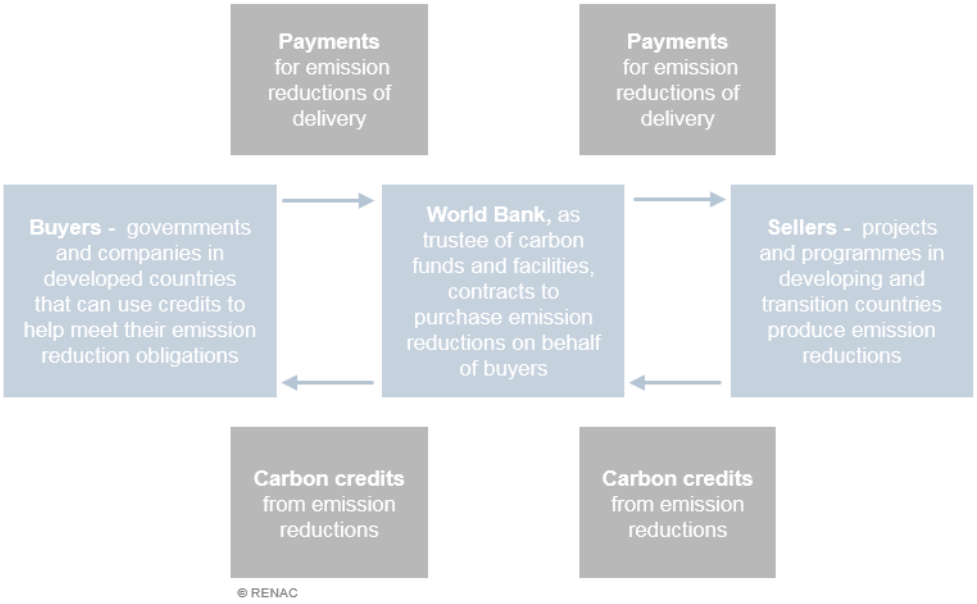
1) Carbon Partnership Facility
2) Forest Carbon Partnership Facility
3) Partnership for Market Readiness
4) Carbon Initiative for Development
5) BioCarbon Fund Tranche 3: Initiative for Sustainable Forest Landscapes
6) Pilot Auction Facility

Kyoto funds and facilities:

1) Prototype Carbon Fund
2) Community Development Carbon Fund
3) BioCarbon Fund
4) Netherlands CDM Facility
5) Netherlands European Carbon Facility
6) Italian Carbon Fund
7) Danish Carbon Fund
8) Spanish Carbon Fund
9) Carbon Fund for Europe
10) Umbrella Carbon Facility

The World Bank acts as a facilitator and catalyst for the carbon market by: demonstrating that emission reduction transactions can contribute to development; providing governments and businesses with "an opportunity to learn by doing" in establishing policies, rules and business processes; and mobilising new public and private resources. The World Bank represents only a small share of the global carbon market, but plays an important role through the signals it sends to other players.

[97] World Bank (2014b)



Role of the World Bank in carbon finance (Horton, Fry, 2011)

2.8 **Climate finance after Paris**

Learning objectives: after this session you should be able to …

- Explain the major outcomes of the COP21, Paris 2015 and the way forward
- Describe the process of country submissions and review agreed upon in Paris 2015

At the Conference of the Parties (COP) in Paris in December 2015, the Parties agreed to establish a framework that is fundamentally different from the Kyoto Protocol. Rather than binding emission limits, which readily lend themselves to market approaches, the new climate regime requires all Parties to announce and implement Intended Nationally Determined Contributions (INDCs) of their own choosing. By the Paris conference, 160 INDCs, reflecting 187 countries, had been submitted.[98] These contributions are not legally binding and come in many forms, ranging from absolute economy-wide targets to peaking years, carbon intensity reductions, and so on.[99] A new transparency system will apply to all Parties, but will be less prescriptive than the accounting of Assigned Amount Units (AAUs) that underpinned the Kyoto Protocol.[100]

Developed countries extended their USD 100 billion commitment to continue at this level from 2020 to 2025. Finance will be part of the collective **review of nations' progress** every five years.[101] The

[98] Climate Action Tracker (2015)

[99] C2ES (n.d.)

[100] Mansell A. (2016)

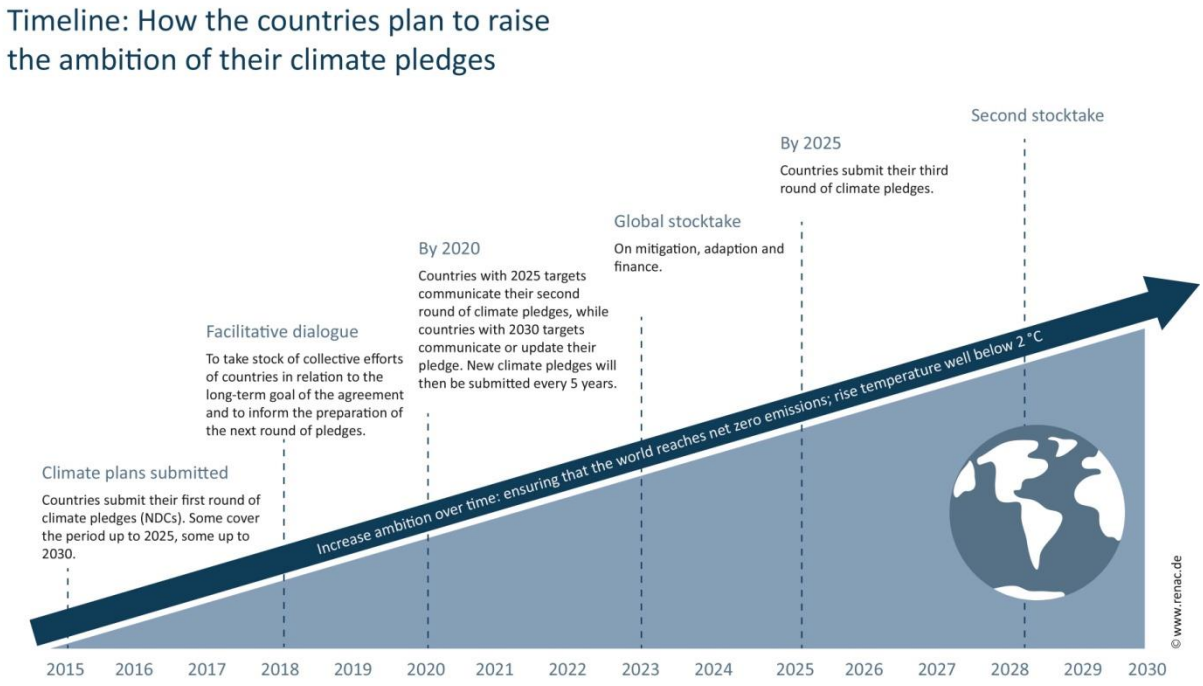
[101] Thwaites J. et al. (2015)

Subsidiary Body for Scientific and Technological Advice (SBSTA) shall develop accounting rules by 2018 to track public climate finance.[102] Developed countries have committed to report every two years on finance. The Paris Agreement encourages developing countries to also follow this practice.[103]

Opposing views on the role of carbon markets were accommodated in Article 6 of the Agreement by creating three different frameworks: [104]

1) one for cooperative approaches to allow the linking of emissions trading systems,
2) one for a new "mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development" likely to replace the Kyoto's flexible mechanisms CDM and JI, and
3) one framework for non-market approaches to sustainable development.

This means that in addition to the financial mechanism, operated by the GCF and GEF, there will be a follow-up mechanism to the Kyoto mechanisms. However, its design is of yet (2016) unclear. As highlighted above (in the section on national climate funds), emissions trading systems also allow the raising of funds for (public) climate finance that can in turn support climate friendly investments.



Timeline: how countries plan to raise the ambition of their climate pledges (CarbonBrief, 2016)

3 Approaches to deliver climate change mitigation and resilience

3.1 Low Carbon/Emission Development Strategies: definition, history and purpose

Learning objectives: after this session you should be able to …

[102] WRI (n.d.)

[103] WRI (n.d.)

[104] Carbon Market Watch (2015)

- Describe the characteristics and potential purposes of Low Carbon Development Strategies (LCDS)
- Describe the relationship between NAMAs and LCDS

Low Carbon Development Strategies (LCDS) (also known as **Low-Emission Development Strategies** (LEDS)) are referred to in different COP decisions, e.g. in the Cancún Agreements (2010): *"to develop low-carbon development strategies or plans in the context of sustainable development".*[105] There is, however, no internationally agreed definition of LCDS, and they are not an official document, unless a government makes it such.

However, as LCDS are country-specific national strategic analysis and planning documents and often carried by a larger stakeholder group within the country, they are characterised by a strong focus on long-term economic and social development while reducing long-term GHG emissions.[106] They typically contain the following elements:[107]

- A compilation of emissions data and projections.
- Economy-wide, broad long-term mitigation goals (in the range of 15 to 30 years).
- A survey of cost-efficient mitigation options and their prioritisation.
- The stipulation of concrete short- and mid-term mitigation actions.

This means they can well serve as a basis on which to develop actual programmes and proposals for climate financing. An example for such programmes are **Nationally Appropriate Mitigation Actions** (NAMAs) which are mitigation actions tailored to the national context and embedded in national sustainable development priorities. Preparing LCDS is an enabling exercise that can help prioritise NAMAs and is useful for considering how NAMAs can work together towards a national strategy in the longer-term.[108]

LCDS are primarily intended to make economic development climate compatible. They can, however, also serve multiple purposes, as shown in the table below.

Since LCDS are not of primary importance in global climate finance schemes, the details of this approach have been shifted to the further reading material. If interested, please refer to the pdf document.

[105] Cancún Agreements, Decision 1/COP.16, Paras 45 and 65

[106] USAID Asia (n.d.)

[107] International Partnership on Mitigation and MRV (n.d.)

[108] OECD (2010)

Stakeholder	Example of possible purposes of LCDS
Governments	Identify country-driven policy priorities for short- to medium-term mitigation and adaptation actions in key sectors.
Private sector	Enhance regulatory certainty for investors by identifying mid- and long-term priorities.
Research institutions	Increase knowledge base, transparency, strengthen institutions (incl. research) and build implementation capacity.
General public	Provide an opportunity for broad stakeholder input into policy planning (e.g. through consultations).
International community	Provide international donors with information on country-driven priorities and needs for funding.

Possible purposes that LCDS elements can serve (OECD, 2010)

3.2 **Nationally Appropriate Mitigation Action**

Learning objectives: after this session you should be able to …

- Describe the concept of Nationally Appropriate Mitigation Actions (NAMAs)
- Describe the regional and technological distribution of NAMAs
- Distinguish between project and policy NAMAs

The concept of **Nationally Appropriate Mitigation Actions** (NAMAs) was first mentioned in the Bali Action Plan in 2007 and progressively clarified by the subsequent COPs. While the format is still evolving, there are certain typical characteristics of NAMAs:

NAMAs…[109]

- are typically initiated by the **public sector**,
- are **tailored to the national context**, characteristics and capabilities,
- are **embedded in national sustainable development priorities** and can, for example, contribute to the implementation of LCDS,
- are **voluntary**,
- are **nationally determined**, rather than negotiated internationally,
- must be measurable, reportable and verifiable (MRV),
- can be **financed by domestic and/or international resources**, and
- can be considered as **mitigation actions to address GHG emissions**, and/ or **detailed implementation plans** for specific mitigation actions (policies, programmes or projects).

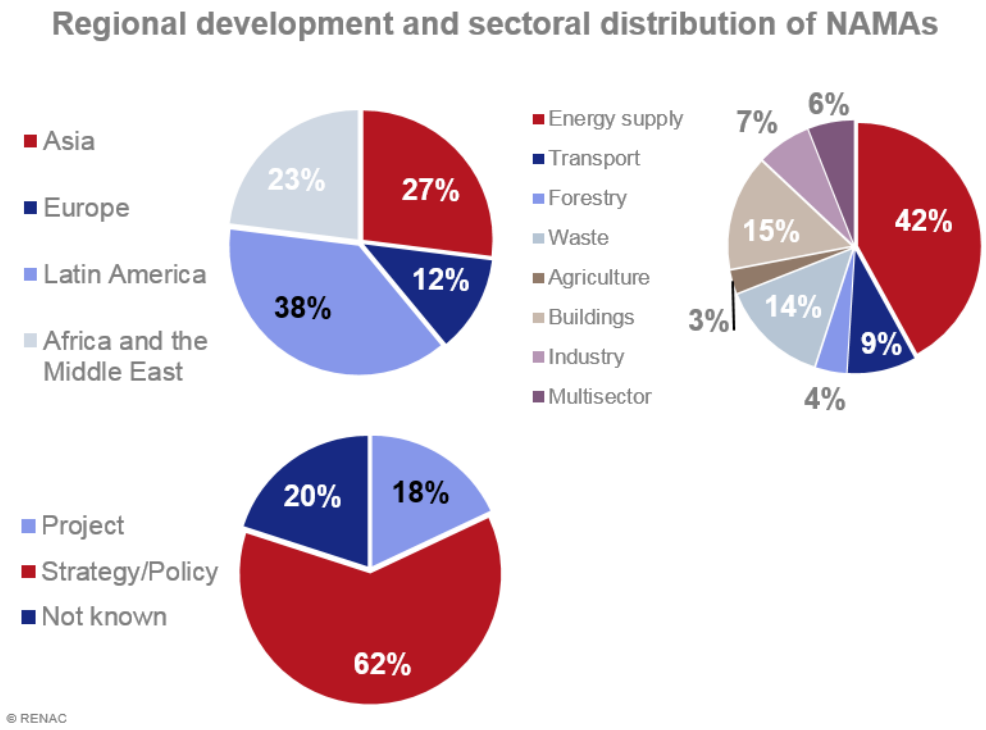
Policy NAMAs are actions at the policy level. These are government led programmes that have been, or are intended to be, embodied in permanent legislation and implemented through policy instruments. NAMAs may have a national or sectoral level scope. Examples include feed-in tariffs (FiTs) for grid-connected renewable energy, emissions trading schemes or building codes that set standards for energy efficiency.

[109] UNEP Risø Centre (2013)

Project NAMAs are specific investments, generally in cleaner infrastructure or machinery. These NAMAs may occur within broader frameworks, such as LCDS, whose ultimate goal is a top-down process through which countries formulate appropriate mitigation actions. Examples of this type of NAMA include solar and wind power plants, promotion of minimum tillage agriculture or deployment of energy efficient industrial motors.[110]

Around two-thirds of all NAMAs are policy NAMAs, project NAMAs constitute only 18%, and for 20% the activity type is unknown.

Almost 40% of NAMAs are located in Latin America. One fourth of NAMA initiatives are in the Middle East and Africa, followed by Asia and Europe. NAMA development is taking place across all economic sectors. The energy sector has the highest share, followed by buildings, waste and transport.[111]



Regional development and sectoral distribution of NAMAs (ECN Policy Studies & Ecofys (2014))

3.2.1 Nationally Appropriate Mitigation Action: possible financing streams

Learning objectives: after this session you should be able to …

- Identify possible financing streams for NAMAs
- Name elements that should be included in a NAMA financing proposal

Financing NAMAs is likely to be a combination of the following four sources: public, private, domestic and international financing, and can be through a range of different instruments (see figure below).

Currently, most NAMAs have received support through the NAMA Facility (http://www.nama-facility.org/start.html), which aims to support developing countries and emerging economies that

[110] UNDP et al. (2013)

[111] ECN Policy Studies & Ecofys (2014)

show leadership on tackling climate change and that want to implement ambitious NAMAs. The Danish, German and UK government as well as the European Commission provide support for projects "to carry out a range of financial and technical measures. However, the main focus is on the mobilisation of additional capital investments to foster transformational change in the partner country." The NAMA Facility has received 138 outlines for NAMA Support Projects (NSP) in three calls. The findings for the 1st and 2nd call were that most NSPs foresee a mix of at least two financing mechanisms targeting different levels of the financial system. Often this is concessional loans for users/consumers by setting up a revolving fund and grant funding elements either for the public sector or producers/developers/consumers or guarantees for banks.

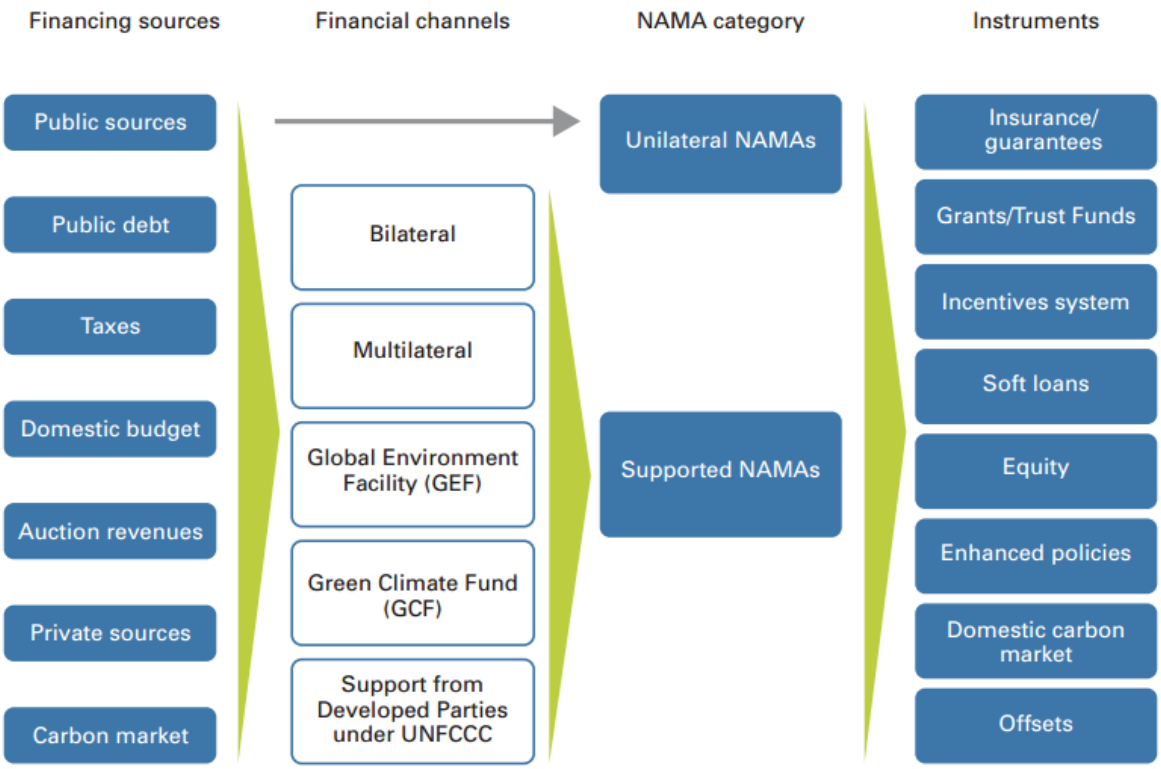
During the 3rd call a number of NSP outlines with more innovative financing mechanisms were submitted, such as concessional loans whose NSP grant element is scaled according to the mitigation potential of the investment.[112]

A mature NAMA financing proposal should include the following elements:

- Analysis/provision of business models for the typical investment(s), including a cost-benefit overview.
- Reasoning for the selection and description of the financial instruments to be employed, and the conditions that must be met in order to use each.
- Institutional arrangement.
- A reasonable phase-out concept, also referring to major risks and barriers.
- Secured domestic and international support.
- MRV system.

This serves partly to inform the government about the current plans for the financial basis of the NAMA in the hope of obtaining approval and implementing it, but it also serves to further engage other financiers with different roles in the financial plan.

[112] NAMA Facility (2016)



Potential financing streams for NAMAs (UNDP et al., 2013)

3.2.2 Example: Burkina Faso Biomass Energy NAMA

Learning objectives: after this session you should be able to …

- Name a good practice element of a NAMA as implemented in the Burkina Faso Biomass Energy NAMA

The **Burkina Faso Biomass Energy NAMA** (2015–2020) aims to reduce emissions associated with biomass use, which accounts for 84% of energy consumption in Burkina Faso, and respective deforestation – e.g. for thermal energy use in the commercial sector – by distributing more energy efficient cooking stoves for traditional beer brewing and the production of shea butter. The project focus is on a more rational and regulated use of biomass, private sector investment and new low emission technologies, which will transform the sector.

It will be accompanied by further benefits to sustainable development, such as more stable supply chains and continuous, more affordable energy access. The project also contributes to a healthier and more resilient environment, reducing indoor and outdoor pollution. The majority of the target group is women.[113]

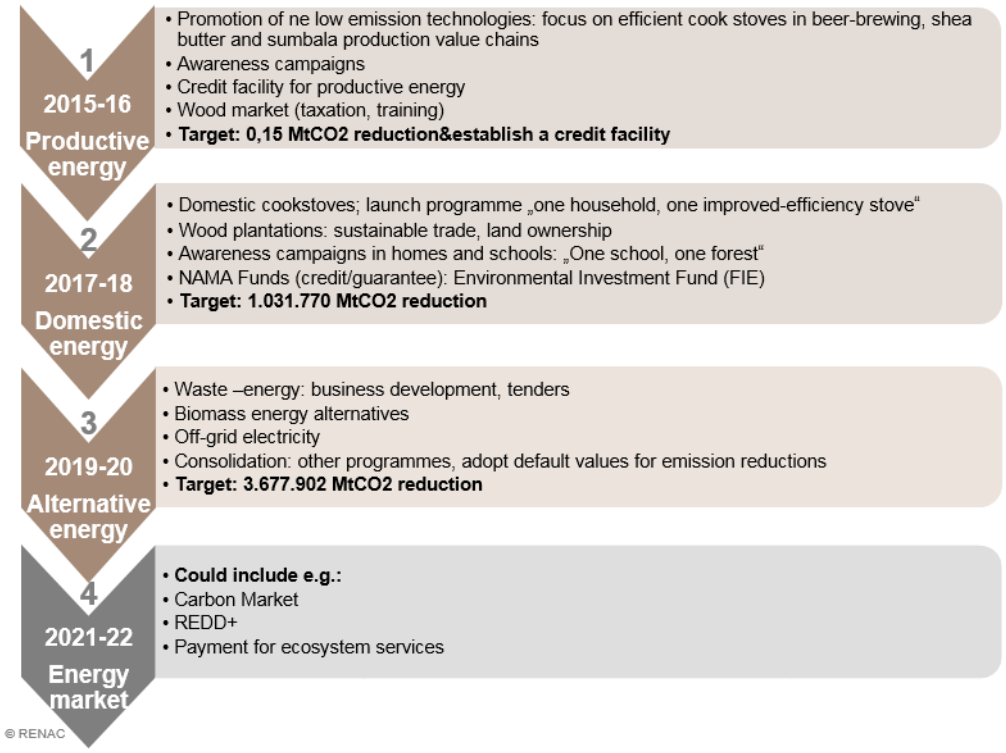
In three phases, the NAMA will target: i) productive energy use; ii) domestic energy use; and iii) alternative energy options and energy markets (see figure). The objective is to enable the biomass energy sector to become a commercially viable, renewable and low emission sector.

[113] NAMA Facility (n.d.)

A range of stakeholders are involved including government agencies, permanent international partners, local NGOs, research institutions, associations and a national financial institution.

Good practice elements of this NAMA are:

- Aims to achieve significant GHG impact and co-benefits.
- Aligned with national strategies.
- Broad scope and long-term change.
- Stimulating private investment.
- High level of cross-organisational coordination.
- Active participation of stakeholders.
- Market-oriented concept.
- Combination of technical assistance and financial components.[114]



Burkina Faso Biomass Energy NAMA (Harms, 2015)

3.3 Project-based climate financing

Learning objectives: after this session you should be able to …

- Understand evolution in climate finance methodologies
- Describe new trends in delivering climate finance

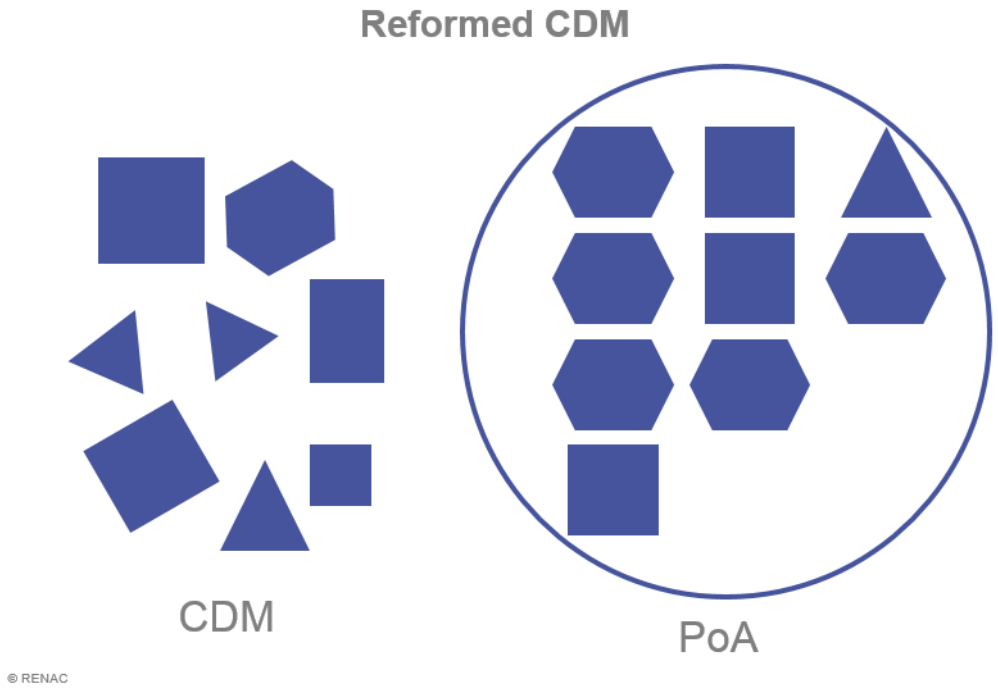
Climate finance activities can be either carried out via individual climate mitigation and adaptation projects or by more overarching programmes that address whole sectors, up to plans covering society as a whole.

[114] Harms (2015)

International public financial support to developing countries is moving towards "programmatic" forms of financial delivery, involving shifts towards budgetary support, including capacity building, policy planning and project level implementation, and away from project-based aid. [115]

In the past, the CDM and Joint Implementation (JI) mechanisms have been solely project-based approaches (left-hand side of the figure). The right-hand side of the figure represents new scaled-up mitigation instruments. Under a Programme of Activities (PoA) it is possible to register the coordinated implementation of a policy, measure or goal that leads to emissions reduction. Once a PoA is registered, an unlimited number of Component Project Activities (CPAs) can be added without undergoing the complete CDM project cycle.[116] The CDM PoA modality takes a step forward in achieving scale by allowing multiple methodologies and technologies to be combined under the same programme. Experts are discussing its potential to expanding CDM or New Market Mechanisms to include sectoral crediting mechanisms like NAMAs.[117]

Some experts note that the move towards programmatic spending will make it nearly impossible in future to separate out "development funding" from "climate funding" (Huhtala et al., 2010).[118]



Notes: Programmes of Activities (PoA)

[115] Boyle J. et al. (2014)

[116] CDM (n.d.)

[117] EC (2010)

[118] Brown J. et al. (2010)

The reformed CDM (on the basis of UNDP, n.a.)

3.3.1 Example for project based financing: Morocco Ouarzazate Concentrated Solar Power Project

Learning objectives: after this session you should be able to …

- Describe the project design of the Morocco Ouarzazate Concentrated Solar Power Project
- Describe the financial flows of the project

The Ouarzazate Concentrated Solar Power project in Morocco supported the following components:

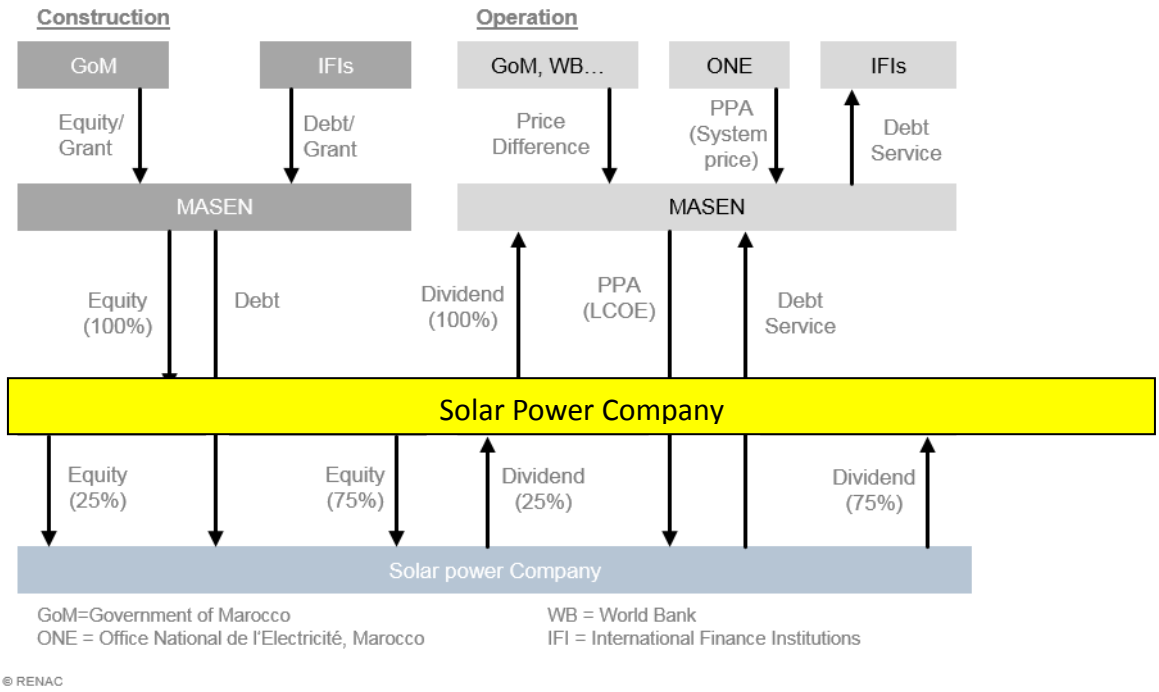
(1) The formation of a public-private partnership (PPP) between the Moroccan Solar Agency (MASEN) and a competitively selected private partner to develop a 160 MW gross concentrated solar parabolic trough plant and its associated facilities (the first phase of the Ouarzazate 500 MW complex).
(2) The partial funding during the first few years of the gap between the costs of concentrated solar power (CSP) generation and conventional fossil fuel-fired generation.

A large part of the project is financed by the PPP partners themselves. Another substantial amount comes from a CTF loan, partly through AfDB and IBRD. Additional finance comes from a partnership between the World Bank (IBRD) and the AfDB, EIB, GEF, KfW and other partners that works to accelerate CSP deployment in the Middle East and North Africa region (MENA).[119]

The 160 MW plant started electricity production in February 2016. When the full system is complete, it will be the largest concentrated solar power plant in the world. Once finished, the four plants at Ouarzazate will occupy a space as big as Morocco's capital city, Rabat, and generate 580 MW of electricity, enough to power a million homes.[120]

[119] World Bank (2011)

[120] CNN (2016), The Guardian (2015a)



GoM = Government of Morocco
WB = World Bank
ONE = Office National de l'Electricité, Morocco
IFI = International Finance Institutions

Contractual arrangements and flows of funds (World Bank, 2011)

4 Climate finance put into practice

Even though NAMAs can take on various forms, and there are no stringent guidelines on which elements have to be included in a NAMA, this chapter provides guidelines on how to develop a NAMA in practice and what to include in it based on experiences so far.

Two aspects that should be considered when developing a NAMA are a Measurement, Reporting and Verification (MRV) as well as a Monitoring and Evaluation (M&E) framework. These systems are discussed in more detail in this chapter.

4.1 Developing Nationally Appropriate Mitigation Actions

Learning objectives: after this session you should be able to …

- Describe the different phases of NAMA development

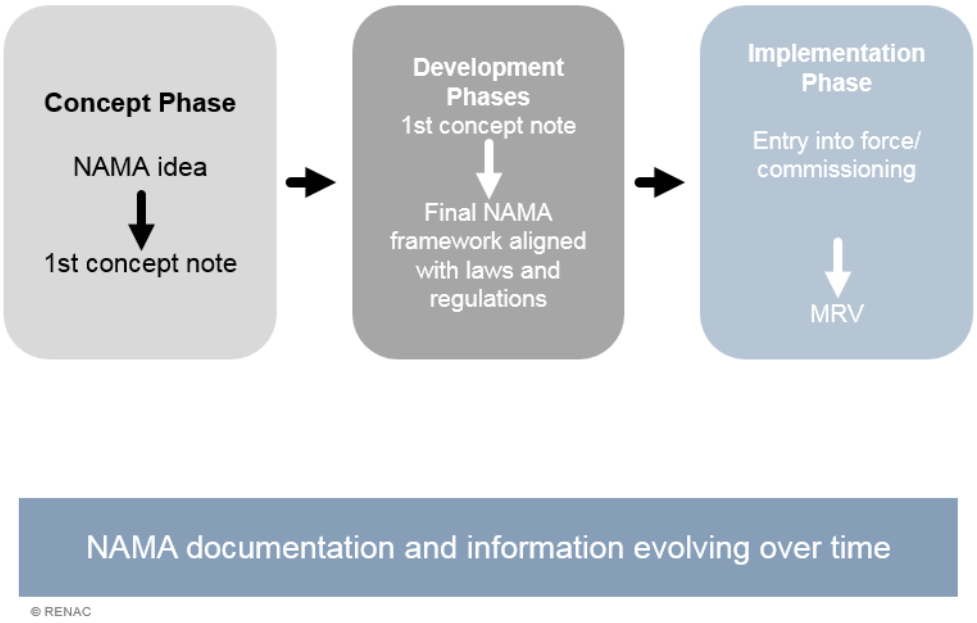
Developing a NAMA can be split into three phases: conception, development and implementation.

The **concept phase** brings the initial NAMA idea through to its first presentation as a comprehensive concept paper. In this phase, NAMA developers should identify and prioritise areas of national or sectoral development plans in which GHG emissions reduction is feasible and desirable, establish baseline and mitigation emissions scenarios, and describe possible policy instruments or measures required to make the emissions reduction happen. They should conduct initial cost estimates and consider means of diverting existing funding or obtaining new funding. Generally, they should also identify probable stakeholders, including possible financiers, and ways of engaging them, plus describe the NAMA's prime benefits and co-benefits. Also, an MRV system should be outlined.

In the **development phase** the ideas inherent in the NAMA proposal are adjusted to coincide with political, economic, social and technical realities. Specific steps in the development phase include:

- The definition of the status quo of GHG emissions and making projections at BAU and mitigation levels.
- The fleshing out of the details of the NAMA.
- The engagement of financial and other stakeholders.
- The definition of responsibilities of the actors involved.
- The formalisation of MRV mechanisms and other evaluation tools.
- The formalisation and submission of all necessary documentation.

In the **implementation phase** the NAMA activity is launched and initial feedback recorded. The NAMA is adapted, if necessary, and the legal/institutional framework, system(s) or project(s) of the NAMA are set into motion. Stakeholder engagement continues.[121]



[121] UNDP et al. (2013)

NAMA development phases (UNDP et al., 2013)

4.1.1 Developing Nationally Appropriate Mitigation Actions – lessons learnt

Learning objectives: after this session you should be able to …

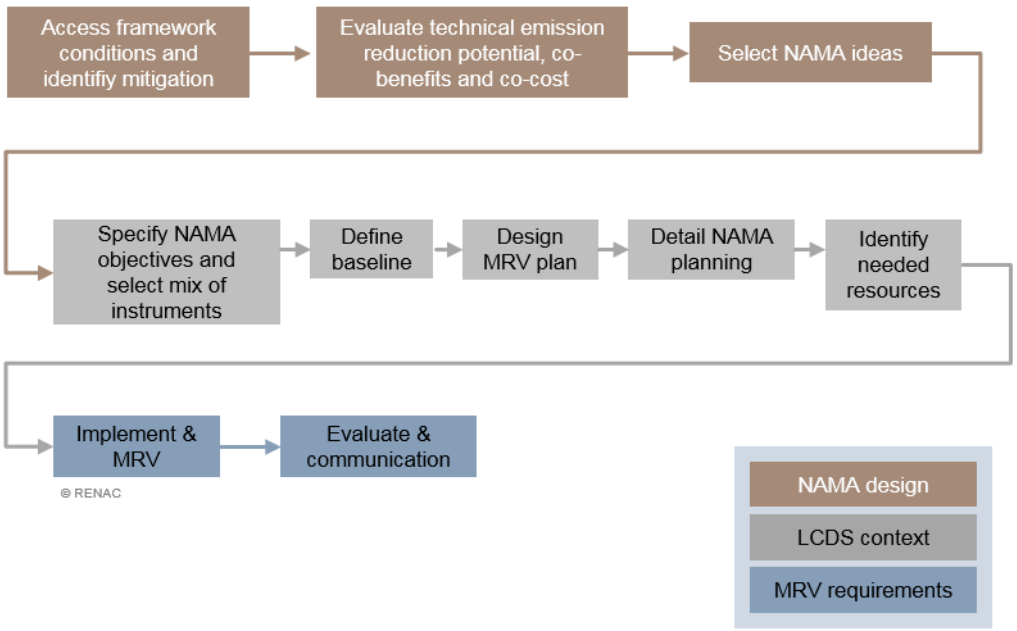
- Name success factors for NAMA development

Early lessons learnt from the development of NAMAs are outlined in the following:[122]

The **interventions and targets** of a NAMA should aim to achieve **significant GHG impact** and contribute to sustainable development and **align with or be embedded in existing LCDS and/or national environment and climate strategies**. The NAMA should include a **diverse set of interventions** (including policies, financial, technical and economic instruments and mechanisms) developed from a thorough analysis of barriers and have a **broad scope** (e.g. sector-wide or national), plus be replicable and/or scalable. It is advisable to **upscale existing programmes**, rather than creating completely new projects. NAMAs should be based on detailed technical analysis of **mitigation options**, **costs and benefits**.

NAMAs should result from a participatory, bottom-up **stakeholder process** and **have a high level political commitment** and ownership, including **inter-ministerial coordination** and involvement. The NAMA should be fully integrated in national processes with clear **institutional ownership** to ensure sustainability of the actions over time and should include a detailed, sufficiently resourced **implementation plan** with clear mandates, guidelines and procedures. The NAMA should include an **MRV (Measuring, Reporting and Verification) framework.**

The NAMA document should include a well defined **finance plan**, differentiating own and external resources, and identify potential public and private resources and **stimulate private investment.**



[122] GIZ (n.d.)

10 steps to a successful NAMA (GIZ, n.d.)

4.2 Measurement, Reporting and Verification (MRV) – concept and purpose

Learning objectives: after this session you should be able to …

- Define MRV
- Explain the concept (and sub-concepts) of MRV
- Name benefits of MRV

What is MRV?

Measurement, Reporting and Verification, commonly known as MRV, originates from within the principles of quality assurance and system management and can be related back to the quality management circle of plan, do, check and act (see figure), in which the MRV (check and act) ensures that the overall system is continuously subject to an internal and external improvement process.[123]

Measurement:

- The collection of essential data needed to conduct reporting and, ultimately, verification. Generally, monitoring will be associated with the measuring of emissions; there are also other elements that may require monitoring.

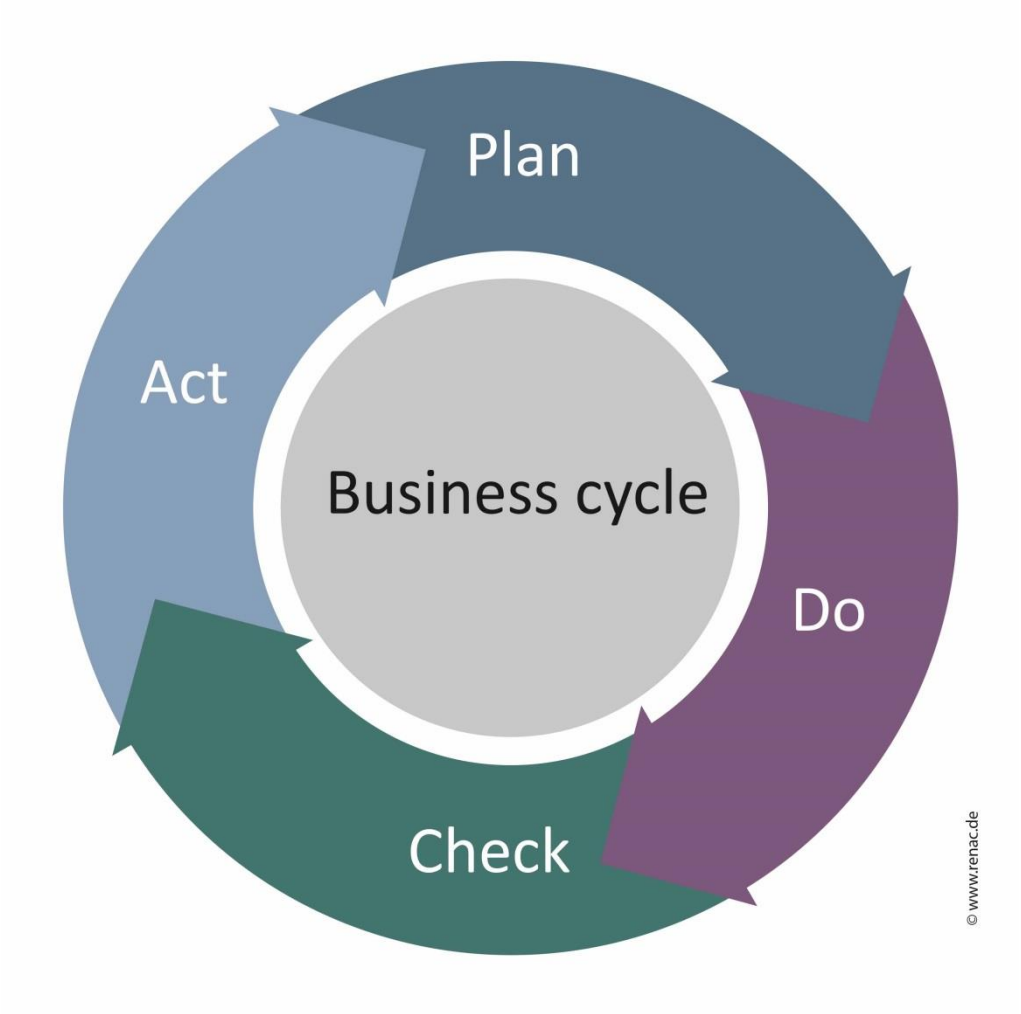
Reporting:

- Direct emissions reporting: an automated, electronic system that reports directly into a dedicated database.
- Indirect emissions reporting: manual registration and calculation of emissions that is then verified before being registered as final emissions data.

Verification:

- Often external independent verification to confirm that the monitoring and reporting is in line with the requirements.

[123] UNEP Risø Centre (2012)



Copyright KfW

Quality management circle of plan, do, check and act (KfW, 2013)

Why is MRV important?

MRV tells us whether the project is on track to meeting mitigation goals. It also:

- Facilitates decision-making and national planning.
- Supports the implementation of a project or programme and generates feedback on its effectiveness.
- Promotes coordination and communication amongst emitting sectors.
- Generates comparable, transparent information.
- Highlights lessons and good practices.
- Increases the likelihood of gaining international support.[124]

[124] UNEP (2014)

4.2.1 Example of a MRV system: Costa Rica

Learning objectives: after this session you should be able to …

- Describe success factors for a well-functioning MRV system

Developing an integrated forestry sector MRV system

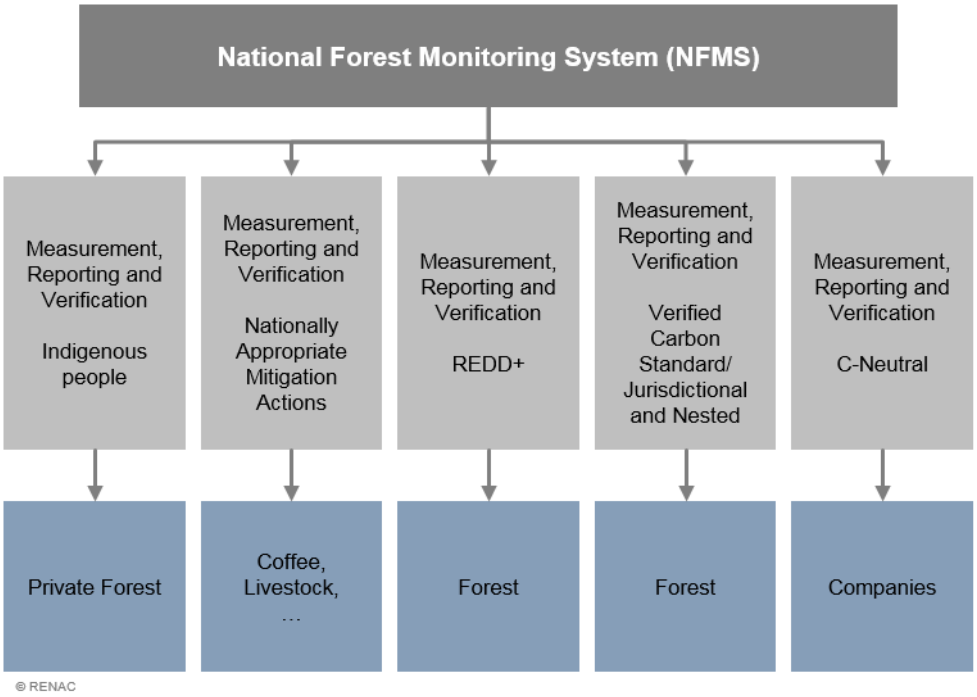
The National Forest Monitoring System (NFMS) is a national MRV system in Costa Rica, currently under development. It aims at improving the coordination and organisation amongst different institutions involved in the forestry sector in Costa Rica in order to generate quality and verifiable information for different purposes. The figure shows the different MRV systems for the different stakeholders involved and the monitored parts of the forestry sector.

Finance

Funding was received from a variety of sources, such as the state, the Forest Carbon Partnership Facility and international donors like NORAD, USAID and GIZ.

Success factors of the MRV system

- High level political commitment.
- Multi-stakeholder participation in monitoring results.
- Transparency and verifiability.[125]



VCS: Verified Carbon Standard, JNR: Jurisdictional and Nested REDD+, IPs: Indigenous people

[125] Vega-Araya (n.d.)

Components of NFMS (Vega-Araya, n.d.)

4.2.2 Nationally Appropriate Mitigation Actions – MRV concept

Learning objectives: after this session you should be able to …

- Define the MRV system requirements for the different NAMA types

There are basic elements of a MRV system that need to be defined according to the NAMA and its stakeholder constellation, as there are different options:

The **scope** that is to be monitored can either be defined on the basis of a cap and trade system, by the number of offsets or by certain incentive programmes or policies.

The **programme oversight** can either lie with the National Accreditation Body, a government department or an international body.

Issuance and compliance can either be controlled by an international body, a government body or an independent and qualified individual or organisation (third party). It is also possible that verification is conducted by a buyer, a supplier or another organisation that has a direct interest in the results of the verification (second party). This may be acceptable in cases where an organisation is providing a disclosure report on compliance with NAMA obligations. Similarly, an organisation itself can do an internal audit to declare compliance with NAMA obligations (first party). It could also be conducted prior to a 2nd or 3rd party verification, to uncover any foreseeable problems that can be resolved internally. The first, second or third party, or a government department, can also act as **a control entity** for verification.

The **standards** to be adhered to can range from ISO standards, international recognised standards (UNFCCC, IPCC, CDM EB, etc.) to bilateral or domestic standards.

Different NAMA types may affect the design of the MRV system. The following table provides a suggested list of minimum requirements for different NAMA types:

MRV elements block	Unilateral NAMA	Internationally supported NAMA
Scope	Activity which impacts emissions: • Energy efficiency programme. • Emission reporting programme. • Emission Reduction programme.	Activity which impacts emissions: • Energy efficiency programme. • Emission reporting programme. • Emission Reduction programme.
Programme oversight	Government department using: • National incentive programme mechanisms.	Multilateral agreement using: • National legislation of cooperating Parties. • National accreditation bodies.
Issuance and compliance body	Government body	Government body endorsed by Parties' signatures to the multilateral agreement.
Standards	Domestic standard	Bilateral standard.
Control entity	First/second Party	Third party or government body.

Minimum MRV system requirements for the different NAMA types (UNEP Risø Centre, 2012)

4.3 Evaluation – characteristics and essential elements

Learning objectives: after this session you should be able to …

- Understand evaluation activities in a project cycle
- Describe the concept of evaluation

What is evaluation?

According to the OECD (2002) evaluation is the systematic and objective assessment of an ongoing or completed project, programme or policy which analyses project design, implementation and results and determines the relevance and fulfilment of objectives, efficiency, effectiveness, impact and sustainability, and enables incorporation of lessons learned into the decision-making process of both recipients and donors.[126]

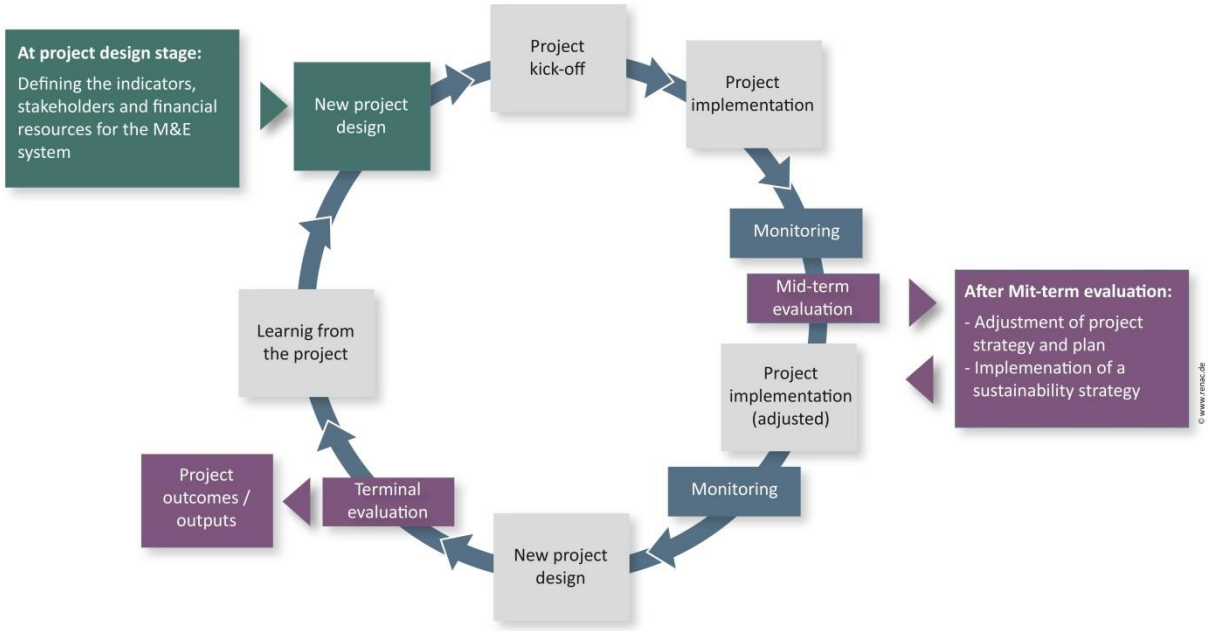
Essential elements of **Monitoring and Evaluation (M&E)** systems are indicators, roles, responsibilities and resources:

- **Indicators** describe what is measured and are designed by the programme or project manager or an external institution.
- **Roles and responsibilities** need to be defined for project managers, data collectors, evaluators, project target groups, project managers, donor or financing institutions and national governments.
- **Resources** refer to the budget for monitoring, HR, data repository and outreach capacity.

The following graph shows when and how M&E elements should be included in a project cycle. During project implementation continuous monitoring should be done. At around halfway through the project

[126] OECD (2002)

a mid-term evaluation should be conducted. On the basis of this evaluation the further project implementation should be adjusted. At the end of the project there should be a terminal evaluation, analysing the project's outputs or outcomes. From this evaluation, lessons for future projects can be drawn.



M&E elements in the project cycle (own illustration)

4.4 M&E compared to MRV

Learning objectives: after this session you should be able to …

- Distinguish between MRV and M&E

While M&E is a general management practice, which is used in climate finance and other projects, MRV is specific to the UNFCCC and climate finance projects. As a negotiated agreement of the convention, it is the approved tool to demonstrate the contributions of projects and climate finance to the objectives of the convention.

Evaluation, on the other hand makes it possible to find out much more about the project to draw conclusions on best-suited approaches and facilitate learning. It helps an organisation to better understand how to improve its performance. MRV modalities like NAMAs and CDM projects can also benefit from evaluations. Evaluations formulate recommendations to the project that is being evaluated, and lessons that are applicable and helpful beyond the narrow context of the project.

Platforms that provide insights on how to do evaluations are:

- International communities of practice like the Climate-eval Group of the GEF Independent Evaluation Office (https://www.climate-eval.org/).
- The Climate ITIG of the International Development Evaluators Association IDEAS (http://ideas-global.org/creating-an-itig/).
- www.better-evaluation.org
- www.mymande.org

MRV	M&E
MRV = **Measurement, Reporting and Verification**	M&E = **Monitoring and Evaluation**
Concept	
• Regular stocktaking of project key information – helps to keep track of project/programme activities and achievements. • Financial and climate-related parameters as well as sustainable development outcomes need to be measured.	• Targeted analysis of project achievements and experiences – helps to analyse project/programme impacts and experiences for accountability, management and learning based on project experiences. • (A project's) achievement is summarised, including its GHG mitigation impact. Audiences can learn how climate mitigation could be done more effectively.
Application	
• Negotiated requirement for UNFCCC projects/programmes focusing on mitigation; specific to UNFCCC. • Evaluation is not part of the concept. • Can relate to: **Climate finance flows, (National) GHG emissions, NAMAs.**	• General concept in Official Development Assistance (ODA), philanthropy and evidence-based policy making. • Evaluation is an established part of the concept. • Can relate to: **Projects, Programmes, Policies.**

M&E compared to MRV (own illustration)

5 Green microfinance: examples

5.1 Introduction

This chapter introduces green microfinance as a climate finance concept.

Green microfinance refers to the provision of different environmentally friendly microfinance practices, products and services by microfinance institutions. Green microfinance products include debt instruments (i.e. microloans for the purchase of clean energy technologies) and risk mitigation instruments (i.e. microinsurance as a safeguard from the risks from climate change).

Learning objectives for this chapter:

- Understand the concept of green microfinance
- Get to know present cases of green microfinance products with climate change relevance

Example of a green microfinance product: solar dryer (Source: Microenergy International)

5.2 **Introduction to microfinance: institutions, products and services**

Learning objectives:

- Become familiar with the concepts of microfinance and microfinance institutions
- Understand the differences between microfinance and traditional banking

Microfinance refers to the provision of financial services to low-income populations. A microfinance institution (MFI) is an organisation that offers microfinance, and a large spectrum of organisations can be considered MFIs. Most provide loans to members, as well as insurance coverage, savings accounts and other services.

The typical microfinance borrower is an individual working in an informal economy and living just above or below the poverty line. This population is frequently called the Base of the Pyramid (BoP), which constitutes more than 2.5 billion people living on less than US$2.50 a day. These individuals usually do not have access to traditional banking services as they lack collateral and a verifiable credit history, which are requirements for obtaining a traditional bank loan.

The main difference between microfinance and mainstream finance is that the impact of microfinance is assessed by taking into account both financial and social performance. The financial returns from microfinance instruments are often below the market average. This is acceptable for MFIs as long as social progress is being made in such forms as: providing low-income clients with access to affordable financial services, generating assets and income, stabilizing consumption and encouraging long-term savings. All in all, the social mission, particular target group and the applied lending methodologies (e.g. group lending) are features that clearly distinguish microfinance from traditional banking.

Customers of a MFI with solar lamps (Source: Microenergy International)

5.3 **Introduction to green microfinance**

Learning objectives:

- Introduction to the concept and components of green microfinance

Green microfinance refers to implementing environmental sustainability principles into the operations of microfinance institutions (MFIs) and promoting environmentally friendly microfinance practices, products and services.

Green microfinance entails a broad spectrum of strategies ranging from “do no harm” policies to positive environmental impact initiatives at the portfolio and institutional levels of MFIs. Three essential types of strategies can be distinguished:

- managing internal and external environmental risks;
- fostering green opportunities; and
- adopting a formal environmental strategy.

An MFI can manage environmental risks by reducing the ecological footprint of its internal operations and its external portfolio of financed activities. Internally, it can raise awareness of good practices and develop procedures to manage paper, water, waste, energy and/or carbon emissions. This is typically the first green strategy MFIs engage in. Externally, the MFI can implement an exclusion list for certain activities with negative environmental impacts or raise client awareness on mitigation solutions.

To foster green opportunities, an MFI can offer specific services to promote environmentally friendly businesses (such as recycling activities), practices (climate change adaptation, using organic fertilizers, seeds, etc.), or the acquisition of clean energy technologies (such as efficient fridges).

When implementing a formalised environmental strategy, the MFI strategically integrates environmental issues into its activities by: embedding environmental concerns in its mission or vision, adopting a formal environmental policy, appointing a person to manage environmental issues and/or reporting on environmental performance to internal and external stakeholders.

Strategies for green microfinance

5.4 **Risk mitigation instruments: green microinsurance**

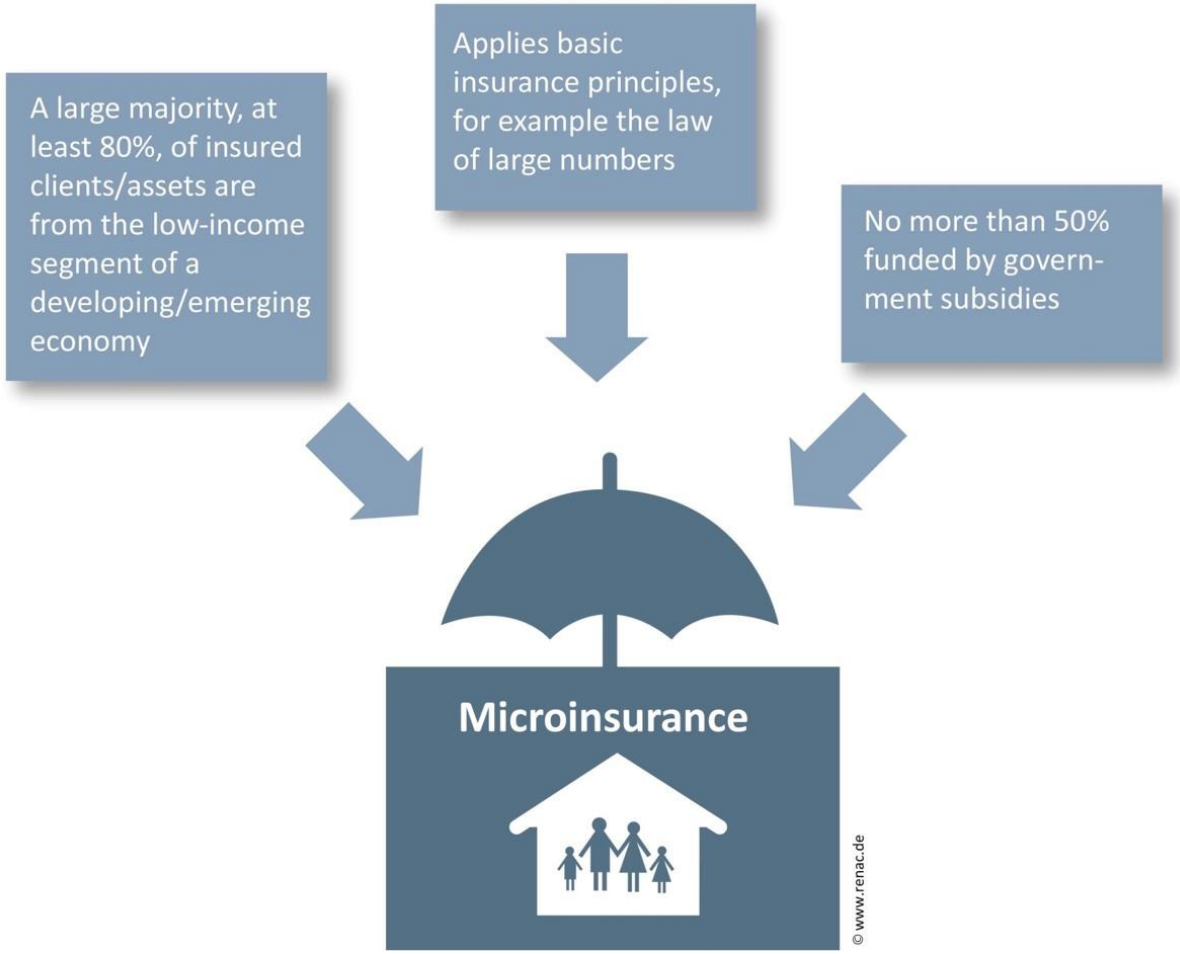
Learning objectives:

- Introduction to the concept of green microinsurance

Similar to insurance, microinsurance offers financial protection against a variety of risks but is specifically targeted to low-income populations. Microinsurance is generally limited to financial products that fulfill the criteria shown in the figure. For a further discussion of the basic insurance principles referred to in the figure, see Allan Manning's Six Principles of Insurance (2010) (Link).

One microinsurance product category is green microinsurance. It can be described as a broad category of insurance products for the protection of the low-income population against certain impacts and losses (e.g. health, property, business continuity) from the occurrence of specific extreme weather events. Slow onset climate change impacts (e.g. rising average temperatures and sea levels) often do not qualify as insurable events. Therefore, they could be targeted by other products and services that provide for a more holistic environmental risk management approach. Examples of risk reduction measures beyond microinsurance include the provision of information to MFI clients on upcoming

extreme weather events, the provision of rewards for behaviour that reduces risk, and the direct payment for risk reduction measures.



Aspects of green microinsurance

5.4.1 Green microinsurance: example from Bolivia

Smallholders in Bolivia are particularly vulnerable to climate change (CC) impacts such as floods and draughts. Traditionally exposed to poverty and food insecurity, the changing climate adds an additional layer of vulnerability and risk that small farmers are ill-equipped to manage.

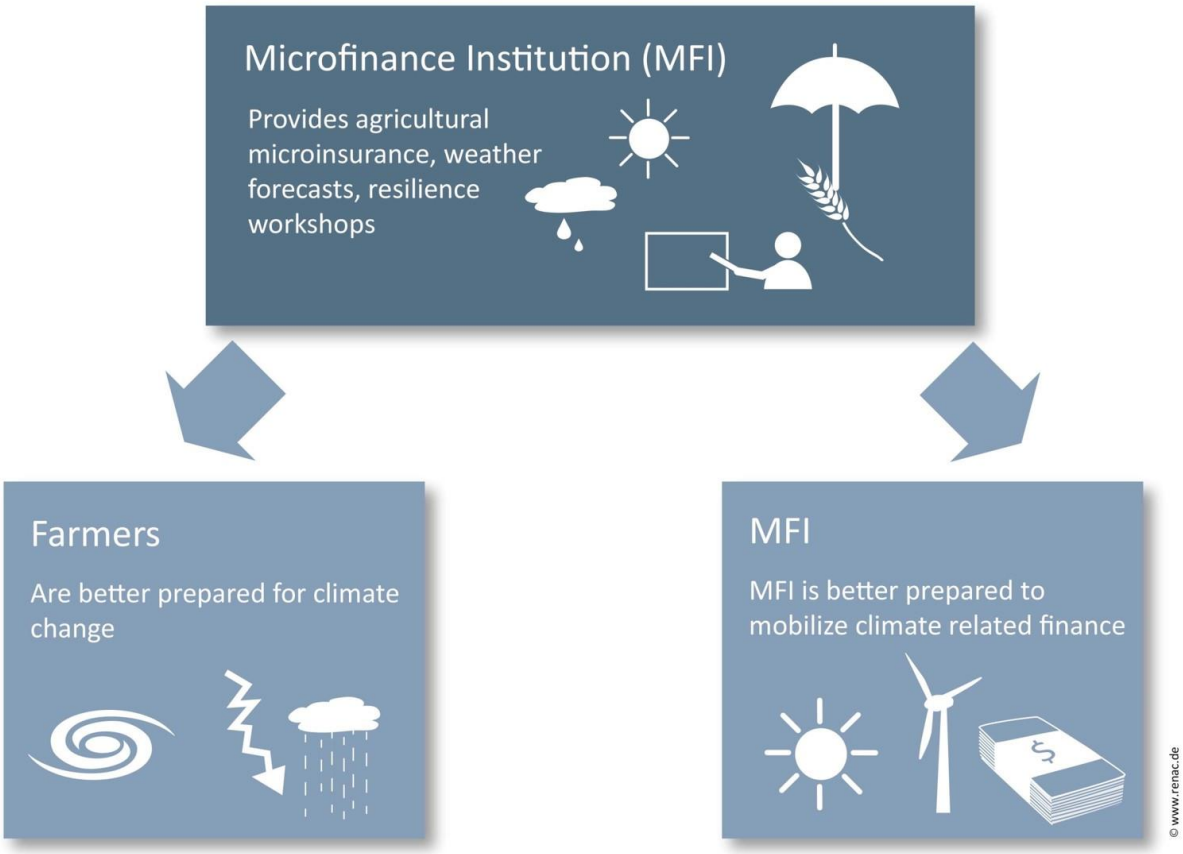
Sembrar Sartawi is a leading Bolivian microfinance institution (MFI). To allow its smallholder clients to adapt to the changing climate, the MFI received support from the Technical Assistance (TA) programme EcoMicro to develop an agricultural microinsurance scheme and other CC risk management services (e.g. targeted weather forecasts) to be able to provide timely finance, to compensate for loss and damage, and to incentivise resilience building activities. By doing so, Sembrar achieves multiple results:

- Improved client access to affordable CC coping mechanisms. Farmers often rely on informal community level risk management strategies, which might not be accessible when extreme events hit entire communities.

- Reduction in overall portfolio risk and increased competitiveness stemming from losses at the client end. MFIs like Sembrar have large numbers of low-income farmer clients and are exposed to their CC vulnerability that materially impacts their credit portfolio performance.

- Increased competitiveness and new business opportunities. The increased livelihood of clients can enhance the financial and social/environmental returns of Sembrar and its potential outreach to new client markets.

- Removal of major climate finance supply challenges. MFIs like Sembrar help fill the gap in the provision of climate finance to the Base of the Pyramid (BoP). In contrast to traditional insurers, MFIs have outstanding geographical coverage, knowledge of local circumstances and the capacity to serve remote and/or CC vulnerable areas. Therefore, MFIs like Sembrar that get involved in CC issues can mobilize the global CC insurance market in line with the visions promoted by high-level CC negotiations.



Overview of the example from Bolivia on green microinsurance

5.5 **Debt instruments: green microcredits**

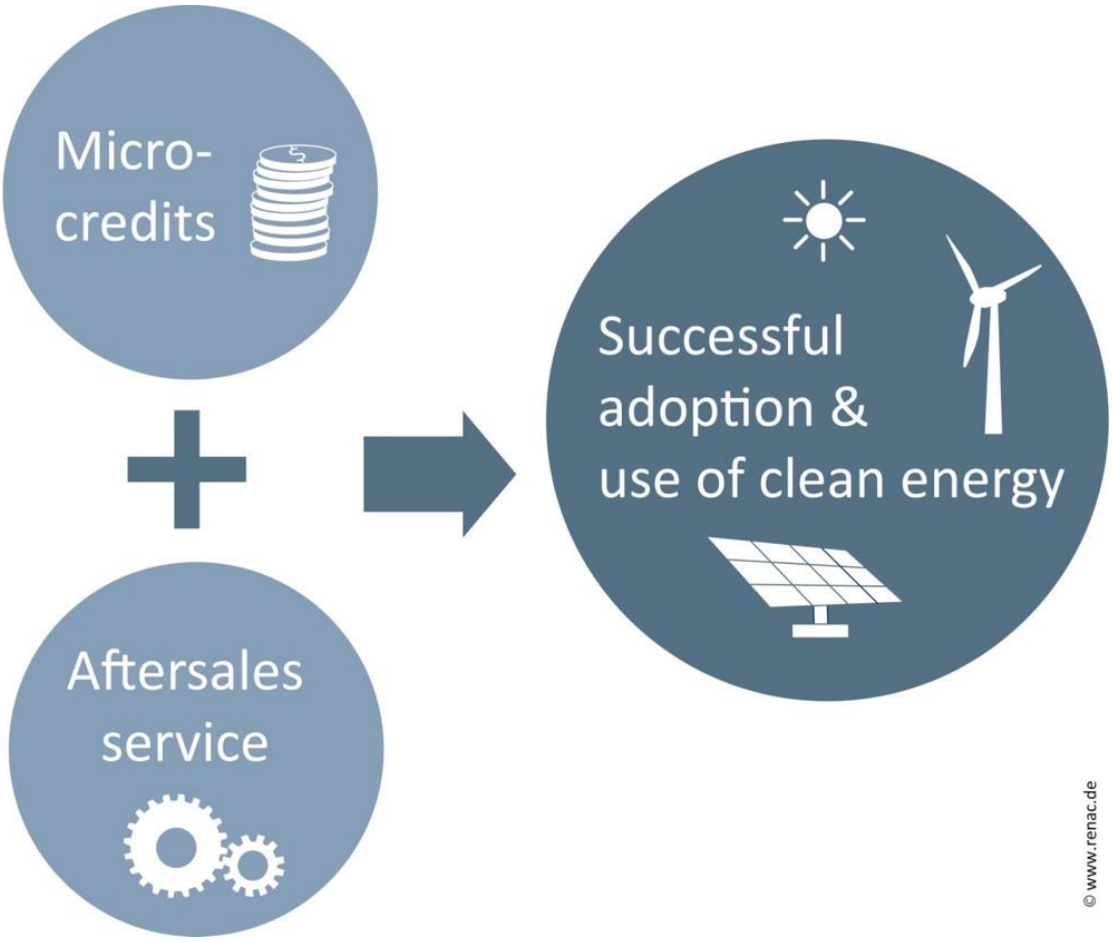
Learning objectives:

- Introduction to the concept of green microcredits

The term “green microcredit” refers to a tailored loan that enables representatives from the Base of the Pyramid (BoP) (households and microenterprises) to borrow for investment in green activities. Currently, the most common type of green microcredit products offered by microfinance institutions (MFIs) aim to enable MFI clients to afford efficient and high quality clean energy technologies (CETs).

The CET microcredits function as regular microcredits but instead of receiving cash the client chooses to purchase a CET device with guaranteed aftersales services that are included in the loan amount. The green microcredits offered by microfinance institutions (MFIs) are targeted to the needs and financial capabilities of selected BoP market segments.

The CET microcredit mechanism is a logical extension to the current business model of MFIs as it helps to strengthen both brand and commercial operations, and social and financial performance.



Principle of green microcredits

5.5.1 Green microcredits: example from Mexico

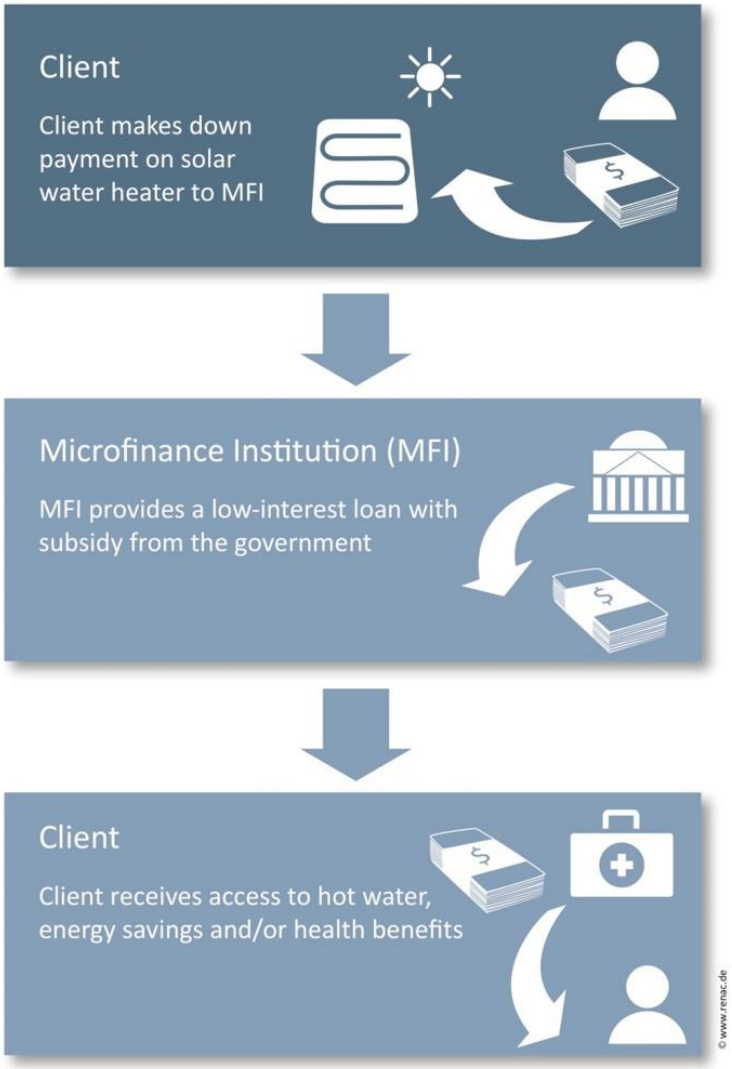
TeCreemos (TCR) is the 8th Mexican microfinance institution (MFI) in number of borrowers and 7th in total loan portfolio out of a total of 66 MFIs in 2013.

TCR received support from the Technical Assistance (TA) programme, EcoMicro, to develop a financial product to finance renewable energy (RE) products. EcoMicro is financed by Mexico's Multilateral Investment Fund, FOMIN, and the Nordic Development Fund. EcoMicro coordinated with different stakeholders, such as technology distributors, governmental entities and consultants, to provide technical assistance to TCR for developing an innovative product for the purchase of solar water heaters.

The product offered by TCR allows merchants, shopkeepers and households to purchase a 150 litre solar water heater (SWH). The product combines a low-interest microloan issued by TCR and a governmental subsidy provided by the Secretary of State for Agricultural, Urban and Territorial development. The client is required to make a down payment, and the product covers the acquisition and installation cost of the SWH.

The goal of the financial product was to benefit both the MFI and its target user. TCR would benefit from boosted image, potential access to new client segments, funding (e.g. impact investors), partners and revenue growth. On the customer side, the new financial product provided household and small businesses with increased savings and health benefits by substituting expensive, inefficient and

polluting energy sources with clean, climate compatible and efficient energy technologies. Thus, the programme would promote an increase in competitiveness, environmental awareness and climate change mitigation and adaptation.



Overview of example from Mexico on green microcredits

5.5.2 Green microcredits: example from Peru:

Since 2010, the Peruvian MFIs Fondesurco and Caja Huancayo have implemented a green microfinance scheme: the Energy Inclusion Initiative (EII). The scheme has aimed to provide microloans for the purchase of clean energy technologies that directly support the economic activities of the clients who purchase them (i.e. support the so-called productive uses of energy). In turn, this increases the disposable income of clients (through increased income and decreased energy costs) and increases their ability to repay their loans.

During the EII's pilot phase, Fondesurco offered two clean energy products to its clients through green microcredits: solar water heaters (SWH) and improved cooking ovens (ICO). The SWHs were preferred by farmers, restaurants and households living in cold regions in Peru, providing them with comfortable access to hot water for taking care of farm animals, for sanitary purposes, and for increased comfort at home after long days of working outside. The ICOs were mainly bought by bakers and by households that previously had to rely on public ovens shared with other village inhabitants.

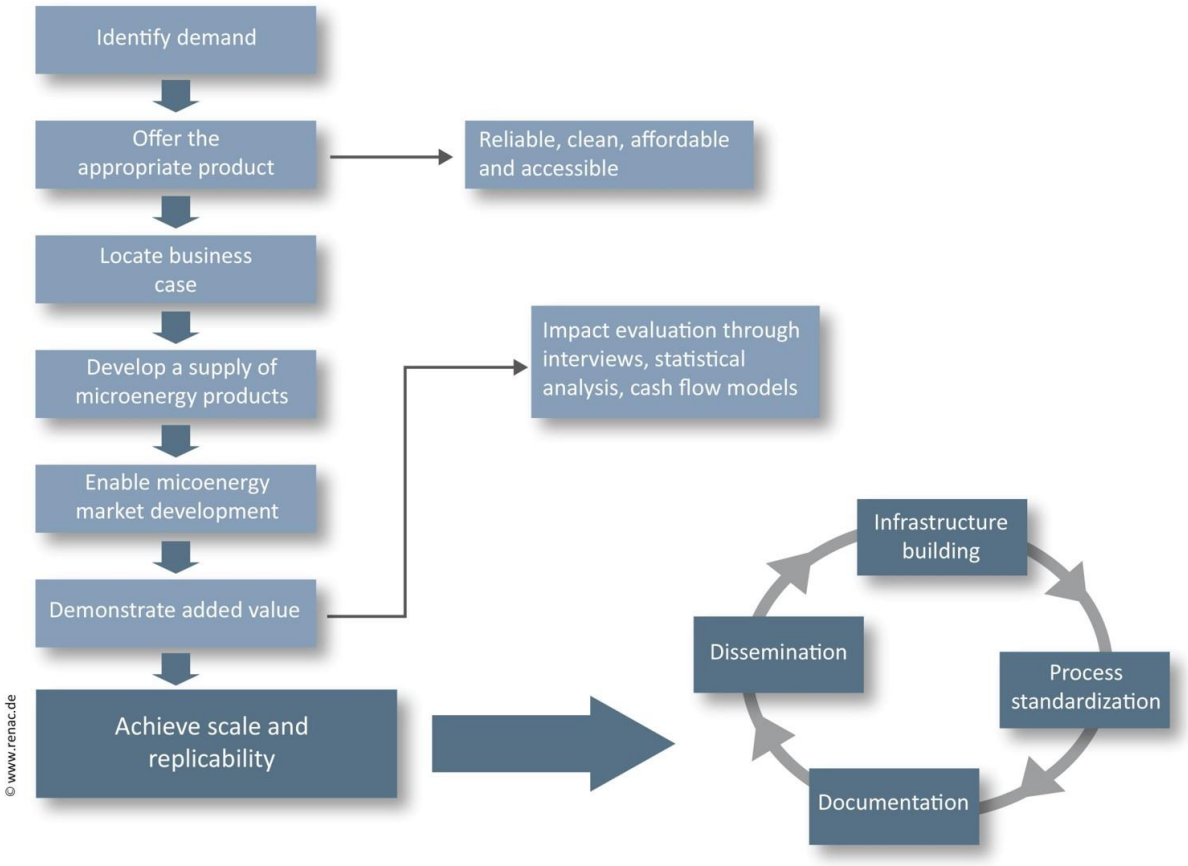


Illustration of a green microcredit business development process

Process of the Energy Inclusion Initiative (Data source: Microenergy International, ADA)

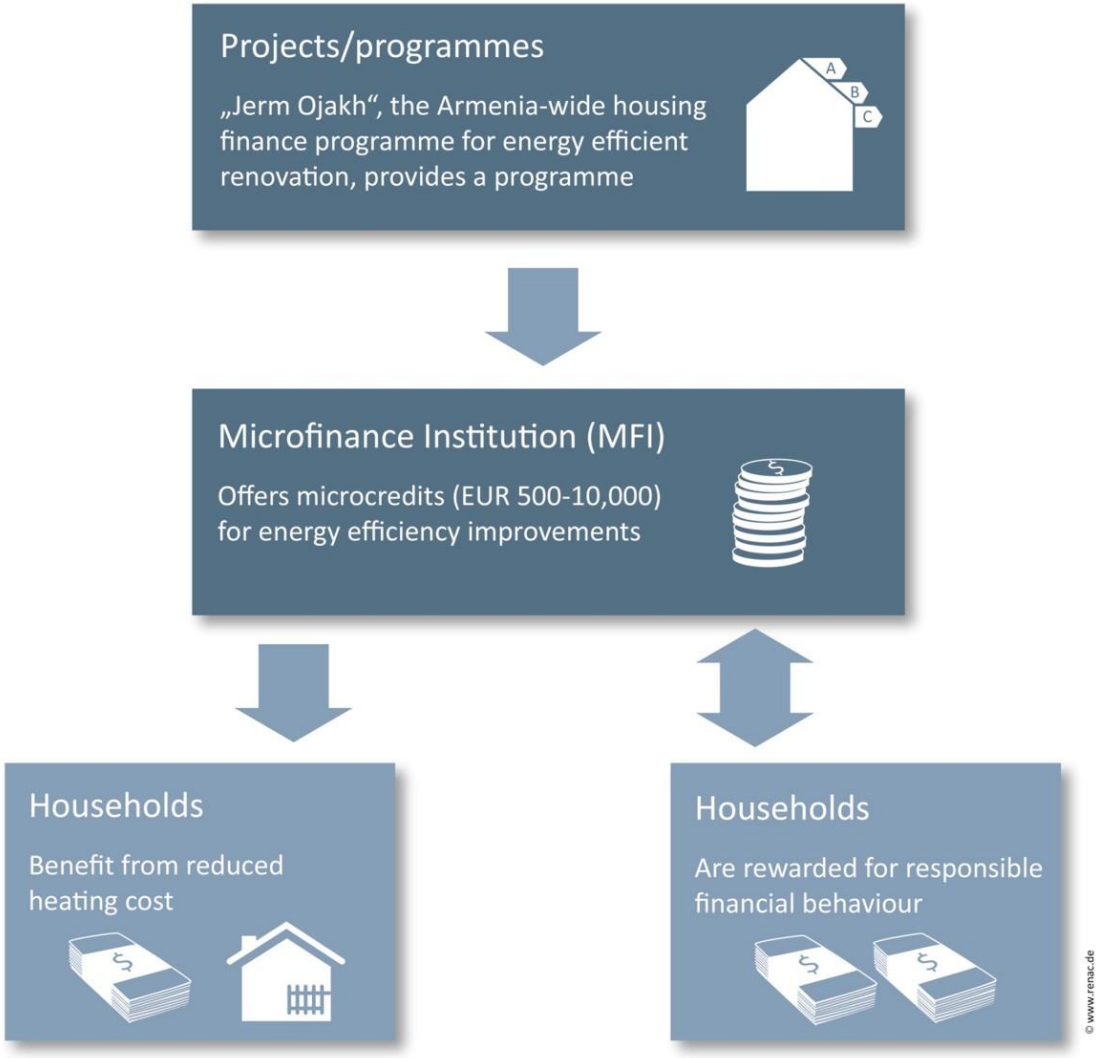
5.5.3 Green microcredits: example from Armenia

The housing situation in Armenia is in a critical condition. Insufficient investment for maintenance, repair and renovation due to the economic crises of the past decades (the fall of the Soviet Union, the sub-prime economic crisis of 2009) have resulted in a deteriorating housing stock.

Energy efficiency was not a priority at the time that most Armenian houses were constructed. However, today the country is experiencing continuous increases in heating fuel prices. More than half of the population lives on a tight budget and low-income and has little or no access to credit. Therefore, access to finance for housing renovation for low- and middle-income groups is of great socio-economic importance.

Jerm Ojakh is an Armenian financial programme aiming to enable low- and middle-income households to renovate their homes in an energy efficient manner. Over 25 local microfinance institutions (MFIs)

access money from the programme to offer microcredits (EUR 500-10,000) for EE improvements in housing, such as windows, doors and insulation replacement. The loans are concessionary - they offer a grace period (up to one year), a bonus for good performance (up to 10% of the amount invested) and relatively long maturity (up to five years). At the same time, households can benefit from lower heating bills (savings of up to 50% or more) and increases in living comfort and property value.



Overview of example from Armenia on green microcredits

5.5.4 Green microcredits: example from the Philippines

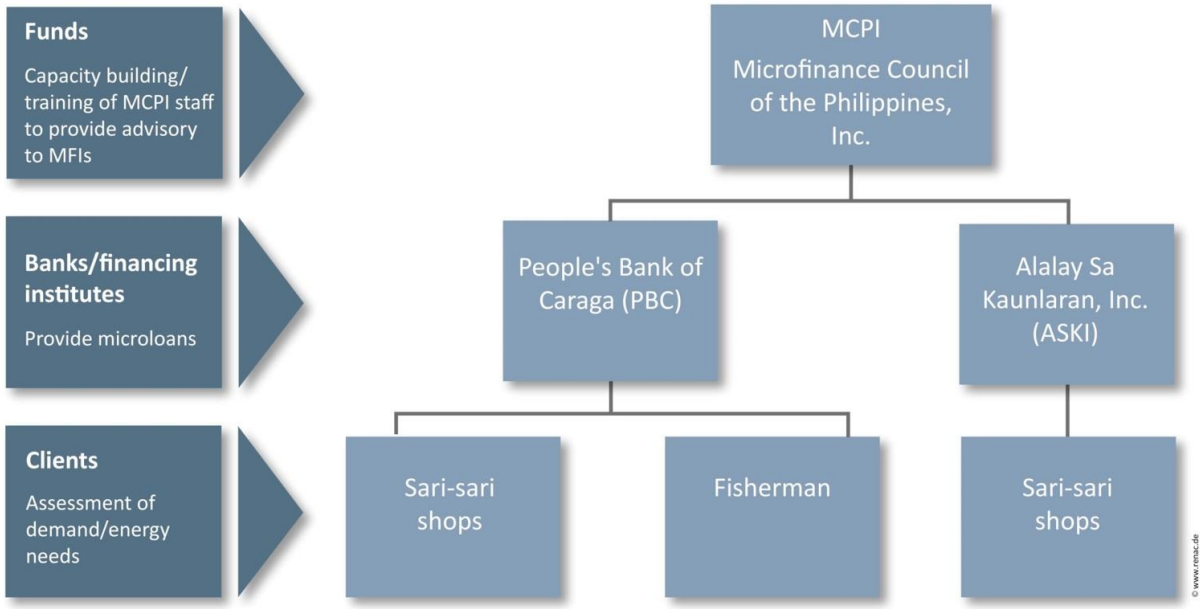
Energy access in the vast majority of the rural Philippine Islands is a major challenge. Expensive, inefficient and unreliable sources of energy reduce the productivity of income generating activities and further contribute to the worsening impacts of climate change.

The Energy Inclusion Initiative (EII) in the Philippines is a programme that has been implemented since 2013 by the Microfinance Council of the Philippines, Inc. (MCPI). It aims to provide green energy technologies to small and micro businesses through microfinance-based energy financing. EII develops the capacity of MCPI to provide technical assistance and scale up the clean energy lending of the 52 microfinance institutions (MFIs) in its network.

With the help of international technical assistants, in late 2014 MCPI selected and prepared two of its member MFIs to run pilots within the EII framework. The MFIs provided the following services: energy

needs assessment, technology/supplier assessment, product selection, energy loan product design and business development, implementation and evaluation. The MFIs selected solar lanterns (portable lamps with mobile charging jacks) and energy efficient fridges as the two products with which to target and benefit sari-sari stores and fishermen. The pilot project enabled:

- the two MFIs to scale up their clean energy financing business and to explore additional renewable/clean energy solutions according to the needs of their clients; and
- MCPI to scale up microfinance-based clean energy lending to all 52 microfinance institutions.



Overview of example from the Philippines on green microcredits

5.6 **Summary**

This chapter introduced green microfinance as a climate finance concept.

Green microfinance refers to the provision of different environmentally friendly microfinance practices, products and services by microfinance institutions. Green microfinance products include debt instruments (i.e. microloans for the purchase of clean energy technologies) and risk mitigation instruments (i.e. microinsurance as a safeguard against the risks from climate change).

Green microfinance products and services have been made available in different markets, including Bolivia, the Philippines, Mexico and Armenia.

Mini biogas digestor under construction – classic example for microenergy products (Source: Microenergy International)

6 Green Microfinance: Checklist for Implementation

6.1 Introduction

Learning objectives for this chapter:

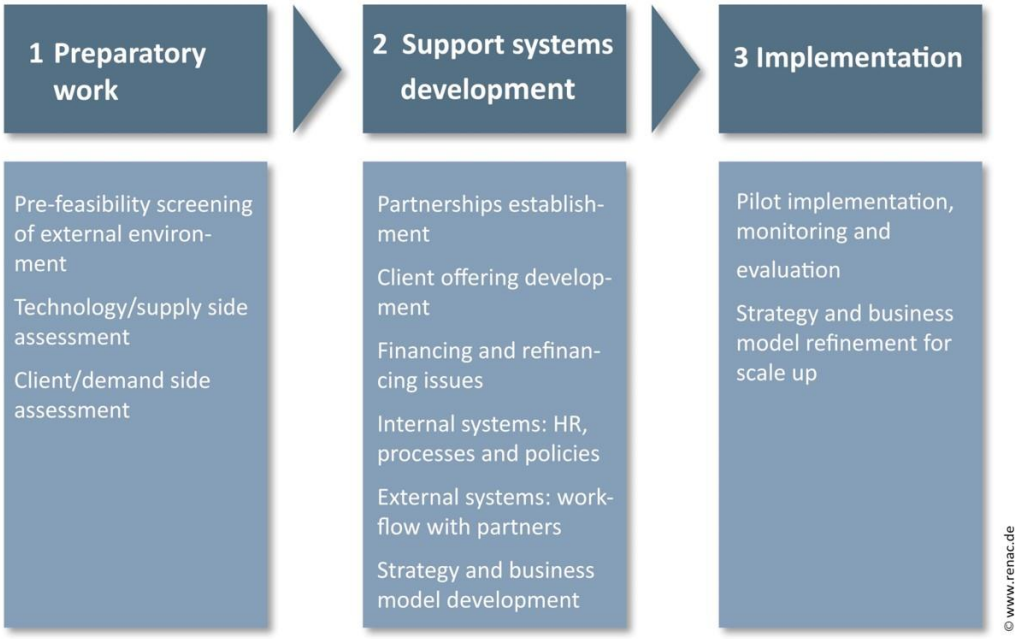
- Understand the main actions and stages in the preparation and implementation of a green microfinance scheme
- Identify the critical success factors for the sustainability of green microfinance schemes

The following chapter outlines the main stages in the preparation and implementation of a green microfinance scheme. Throughout the chapter, a checklist for green microfinance project implementation will be developed. This checklist is relevant for microfinance institutions, technical assistance providers/consultants, or donors who aim to directly implement or act as a driving force for the establishment of green microfinance schemes. The full checklist is presented at the end.

The entire process is split into three phases, which will be explained one-by-one in the following sections:

- The preparatory work describes the activities that are necessary to prepare the final decision on the actual business plan.
- The support systems development comprises details on internal and external processes, relationships and strategies, wrapping up with the actual business plan development.

- The implementation phase talks about the implementation of a first pilot project and how this leads to a refinement of the business plan before scaling it up.



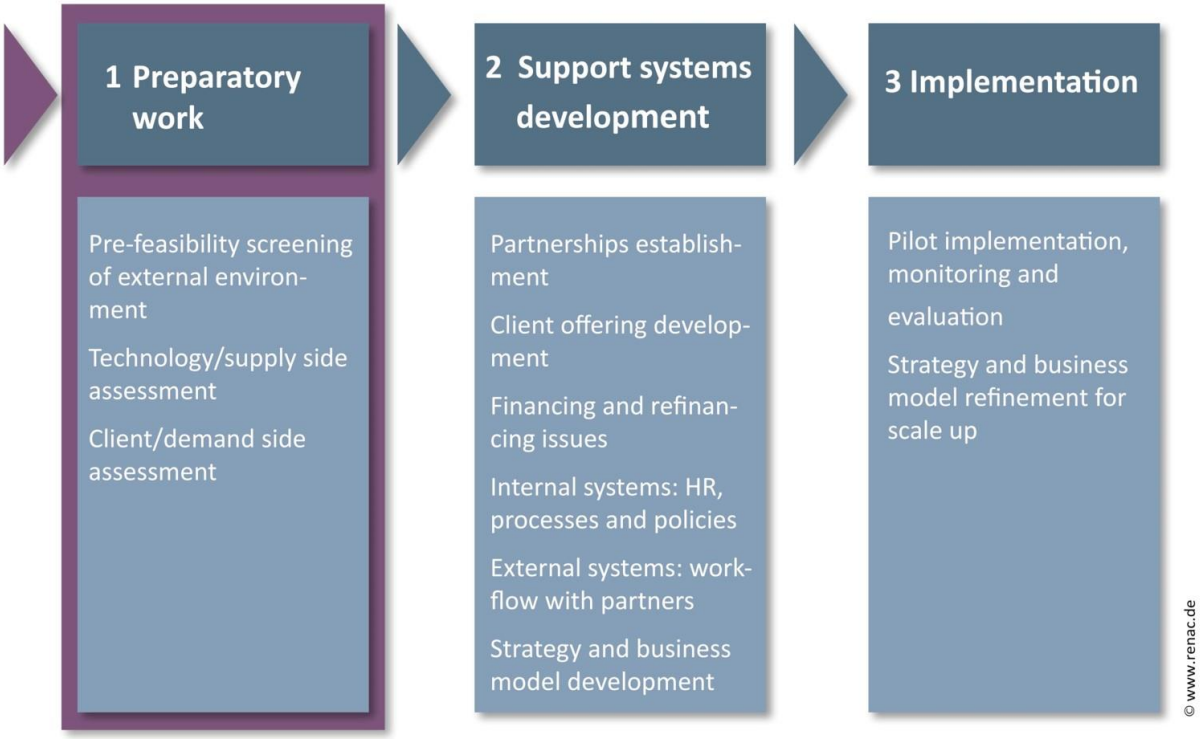
Three phases of a green microfinance project

6.2 **Preparatory work**

Learning objectives:

- Recognise the important factors and steps to consider when preparing green microfinance schemes and assessing their viability

Before starting to offer green microfinance products and services, an initial overview of the target operation region or country needs to take place to ensure that there is an enabling environment for green microfinance. A macro and micro analysis of the external environment needs to take place to establish the overall viability of the envisioned scheme. In addition, a supply side assessment is necessary to identify the technology that should be offered. As a third part, a demand side assessment to identify the energy demand of certain sectors or clients is required. The following pages will explain these aspects in more detail.



First phase of a green microfinance project: Preparatory work

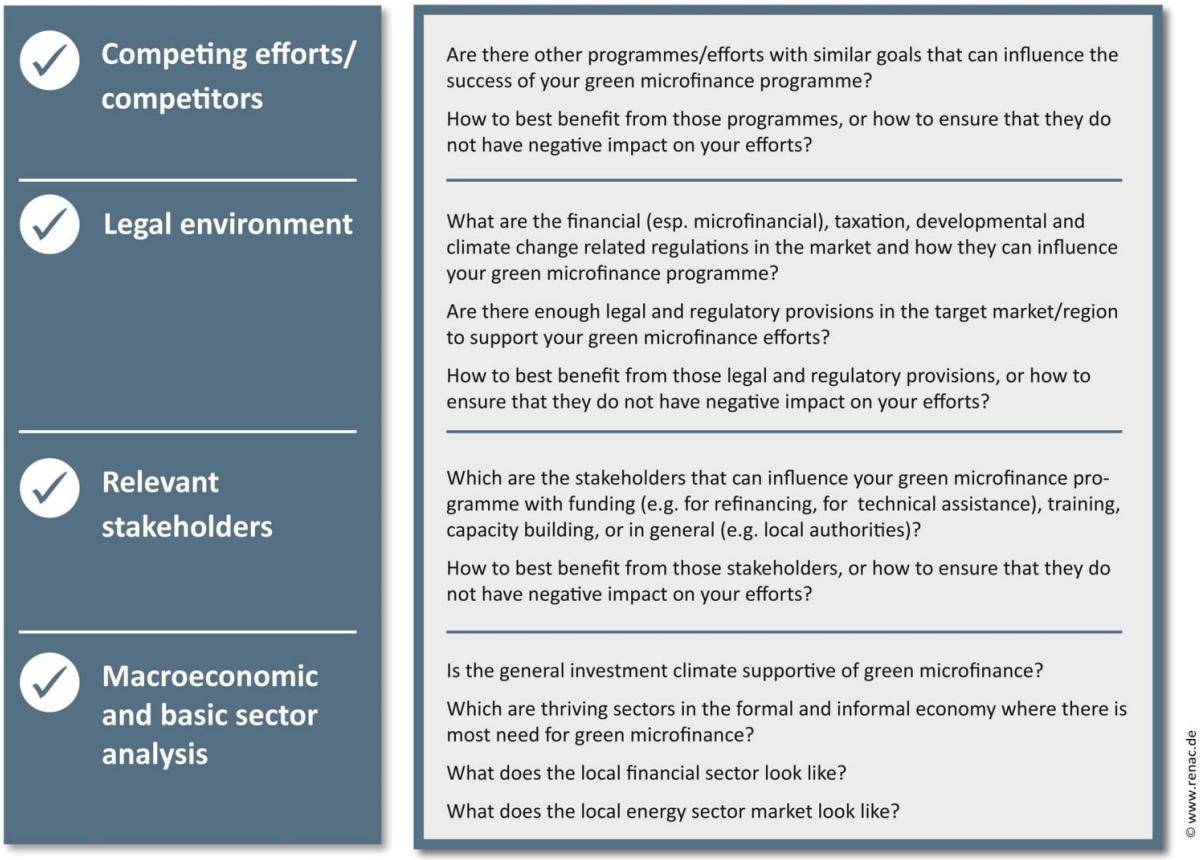
6.2.1 Pre-feasibility screening of external environment

Learning objectives:

- Get to know the external environmental factors that are important when preparing green microfinance schemes

Before setting up a system for offering green microfinance products and services, a pre-feasibility screening of the external environment in the target country or region needs to take place. The ultimate aim is to identify the market potential of green microfinance in general and certain products and services in particular.

For example, jurisdictions in many developing countries still have no legal provisions for offering parametric weather index microinsurance, which has high scale up potential and relevance as a climate finance vehicle for climate change adaptation. In such a case, the legal environment for a microfinance institution (MFI) wanting to offer green microinsurance is not appropriate, and the MFI should consider other low-risk options to get involved in green microfinance.



Checklist for pre-feasibility screening

6.2.2 Technology/supply side assessment

Learning objectives:

- Get to know the actions that comprise a basic supply side assessment process

To set up sustainable green microfinance programmes, it is necessary to assess the local supply of energy efficiency (EE) and/or renewable energy (RE) and other environmentally friendly products and services. The goal is to:

- study the local market availability of EE and/or RE and other environmentally friendly products and services; and
- identify motivated and capable local suppliers who can offer such products with the support of microfinance schemes.

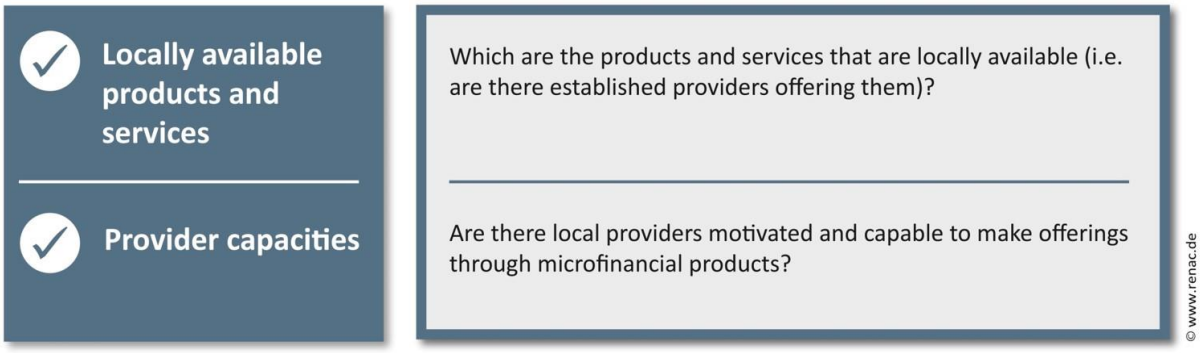
Finding viable suppliers is challenging mainly due to the need to verify the supplier's ability to meet the myriad requirements of green microfinance products, e.g. stakeholder expectations (especially from MFIs).

A supply side assessment involves the following:

- Identifying suppliers. Contacting stakeholders and surveying the local market availability of different products and services to generate a comprehensive initial list of providers.

- Soliciting information on suppliers' business, products and services by:
    - Visiting and observing selected suppliers' offices, outlets and project sites.
    - Checking with previous customers on the supplier's delivery performance, adherence to contract terms, what (if any) problems arose and how they were resolved, etc.
    - Interviewing relevant supplier staff.
    - Collecting additional documents (e.g. business licenses, quality certificates, annual financial reports).

- Analysing and shortlisting of potential suppliers on the basis of:
    - Quality of technological product offerings, services and professional know-how.
    - Interest in working with MFIs and/or microfinance.
    - Financial status, capacities and motivations to scale up their business through microfinance.
    - Interest of other stakeholders (e.g. microfinance institutions) in collaborating with these suppliers.



Checklist for supply side assessment

6.2.3 Client/demand side assessment

Learning objectives:

- Get to know the aims of a client/demand side assessment for setting up green microfinance schemes

To set up sustainable green microfinance programmes it is necessary to assess the demand for energy efficiency, renewable energy and other environmentally friendly products and services. The goal is to identify "energy and environment sensitive" sectors and clients that would demand green microfinance products and services.

This demand side assessment involves the following:

- Gathering client information from the MFI(s) wishing to participate in the green microfinance scheme to define expected target groups (e.g. informal micro-, small- and medium-sized enterprises (MSMEs), households etc.) by:
    - Analysing existing MFI portfolios, e.g. according to client structure, sectors, investment, volume, financial and non-financial products.
    - Interviewing and gathering expectations from MFI staff, e.g. high management, front-office staff.

- Gathering information directly from current and potential target client segments to establish their needs, desires, ability and willingness to pay (investment capacities and preferences) for different green microfinance products and services. This is done by conducting targeted client surveys, focus group discussions and direct observations on clients' assets and income sources, energy equipment and materials currently used, energy consumption and costs, practices of and risks (exposure, vulnerabilities) from interaction with natural environment, etc.

Ultimately, the demand side assessment gives indications of the green microfinance products and services available (supply side assessment) are most appropriate to the target market and thus most viable to be selected for development of targeted client offerings.

Economic factors influencing demand

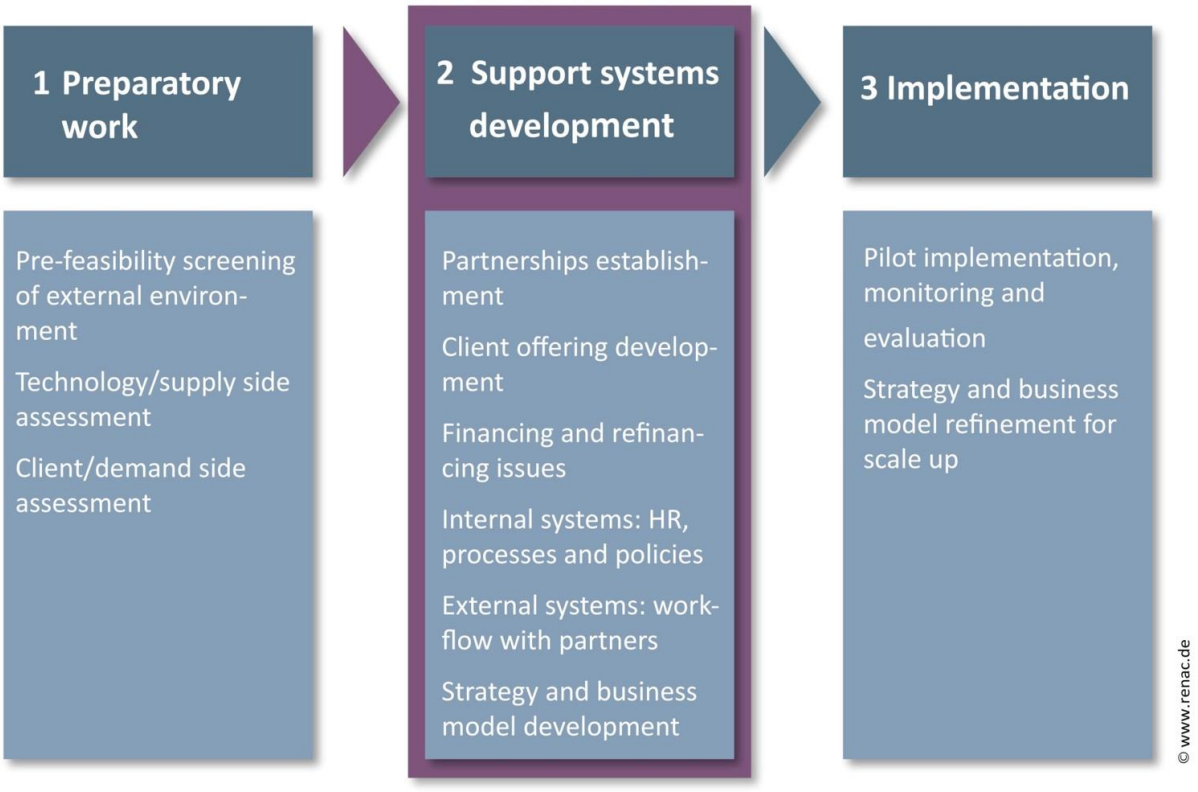
6.3 **Support systems development**

Learning objectives:

- Understand the factors and steps that are important when preparing the practical implementation of a green microfinance scheme

Once it is clear which green microfinance products and services could be offered (i.e. because demand is high and suppliers are present), the next step is to define an operational framework of support systems.

The development of such support systems aims to ensure that the necessary conditions are in place for the practical and sustainable implementation of the envisioned green microfinance scheme. It comprises that partnerships are established, with whom the actual microfinance product or service is developed. Financing and re-financing issues have to be clarified. It is similarly important to clearly define internal processes and policies as well as workflows and responsibilities with external partners. Then a joint strategy and business model can be developed.



Second phase of a green microfinance project: support systems development

6.3.1 Partnerships establishment and contracting

Learning objectives:

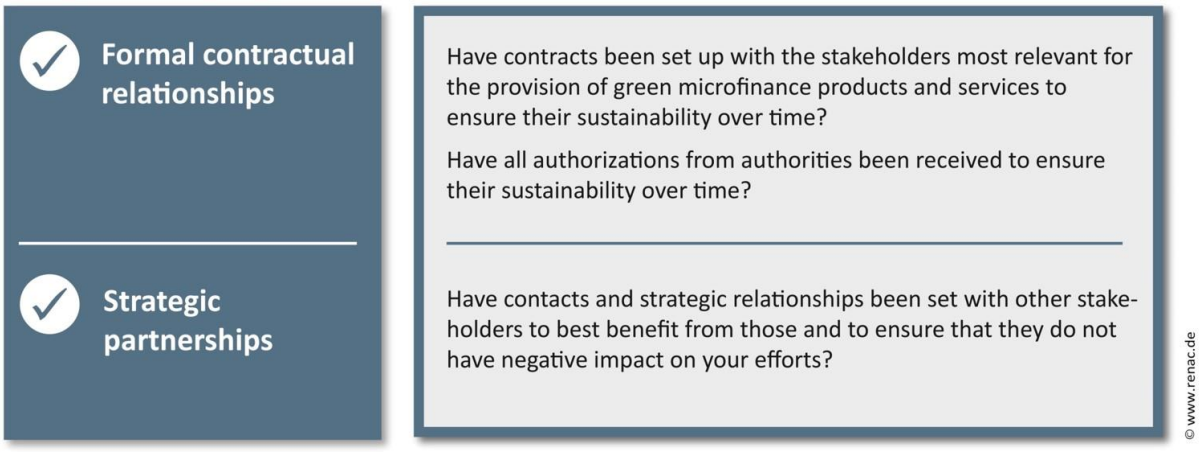
- Recognise the relevant stakeholders

- Understand the importance of establishing partnerships for offering green microfinance products and services

The establishment of formal partnerships is an important part of the development of support systems for green microfinance schemes. While technical assistants are often involved from the very beginning (i.e. they carry out the preparatory work and are contracted by donors and/or MFIs), formal partnerships between other critical stakeholders happens once the feasibility of the green microfinance scheme has been established based on the preliminary assessments that have taken place. Other stakeholders could include:

- Financiers (i.e. MFIs)
- Re-financiers (e.g. commercial or developmental banks offering refinancing to MFIs to offer green microloans, or insurers and reinsurers helping MFIs to offer green microinsurance)
- Technology and information providers (e.g. providers of clean energy technologies, weather and climate data providers)
- Local authorities (e.g. financial regulator to provide its "stamp of approval," new business licenses, etc.)
- Distribution infrastructure providers (e.g. agro-shops and cooperatives)
- Additional donors (e.g. financers to scale up funds for additional technical assistance, training, etc.)

The establishment of partnerships is a process that takes time as it requires trust building and negotiations of concrete terms and conditions. Formal partnerships are usually set through Memorandums of Understanding (MoU), contracts and other formats.



Checklist for partnerships and contracting

6.3.2 Client offering development

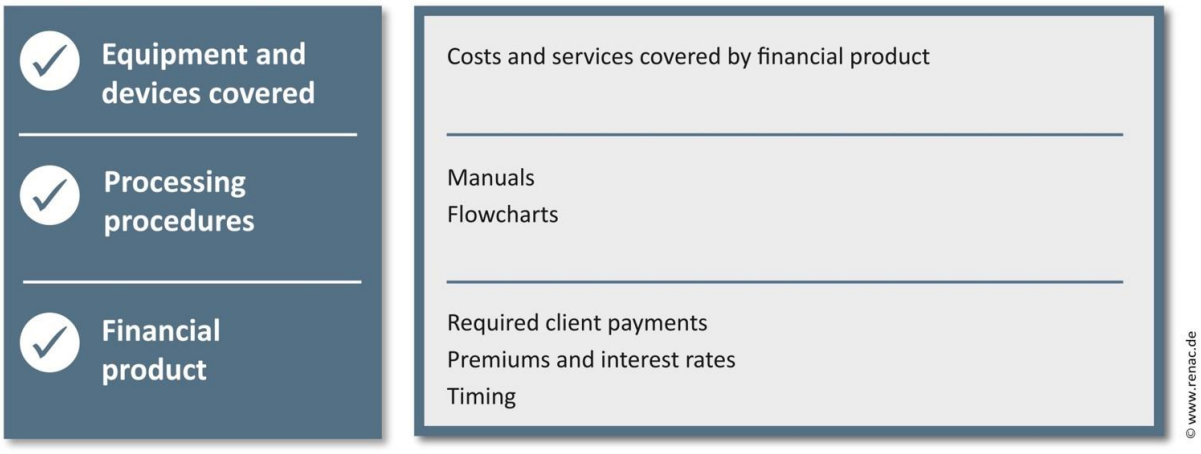
Learning objectives:

- Understand the design of green microfinance products and services

- Name the relevant aspects of green microfinance products

Developing a bankable client offering is an important part of green microfinance schemes. The aim is to design a cost-efficient green microfinance product that matches the supply/demand profile of the region and is both flexible and reliable.

- For green microloans this would include:
    - Defining the cost (i.e. offering price inclusive administrative expenses and mark-ups) and benefits (i.e. equipment and services like aftersales services, installations offered) of the green microfinancial product.
    - Defining the terms and conditions for the green microloan: e.g. size and frequency of repayments required by the client, additional transaction costs; maturity, interest rate, gratis period, bonus schemes and/or subsidies, type (individual vs. group loans), down payment (i.e. initial payment required).
    - Elaborating the procedures for processing and making available green microloans to clients (e.g. flowcharts, manuals).
- For green microinsurance this would include:
    - Defining the cost (i.e. actuarial calculations to calculate required risk premiums to cover administrative expenses) and benefits offered for the price of the green microinsurance product (e.g. costs covered, insurable events).
    - Defining the terms and conditions for the green microinsurance product: e.g. assured monetary ranges, triggers for payments, insurable events, risk premiums to be paid by clients, type of product (e.g. index-based vs. indemnity based vs. hybrid; voluntary vs. mandatory), exclusions, duration.
- Elaborating the procedures for processing and making available green microinsurance to clients (e.g. flowcharts, manuals).



Checklist for product, service and processing

6.3.3 Financing and refinancing issues

Learning objectives:

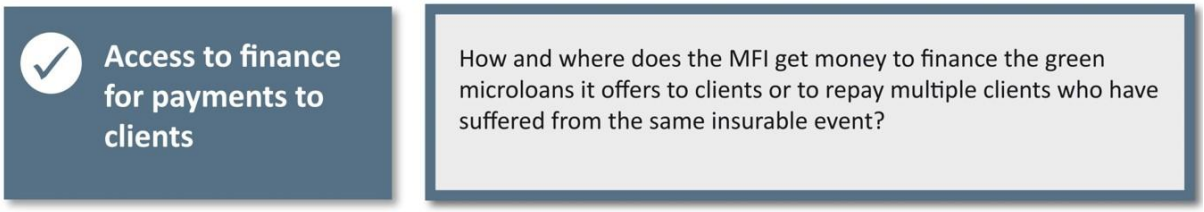
- Become aware of financing and refinancing issues in green microfinance schemes

When developing green microloan schemes, making robust sales estimations is necessary to establish the amount required to finance the green microloans (i.e. working capital needs). Developing a framework to ensure sufficient working capital is an important part of the development of a green microfinance schemes. In case the institution offering the financing (i.e. the MFI) is not prepared or does not have the financial means to meet the expected lending requirements, this would lead to lost business in the short-term (i.e. missed opportunities) and long-term (i.e. client dissatisfaction). MFIs can access finance for green microloans through:

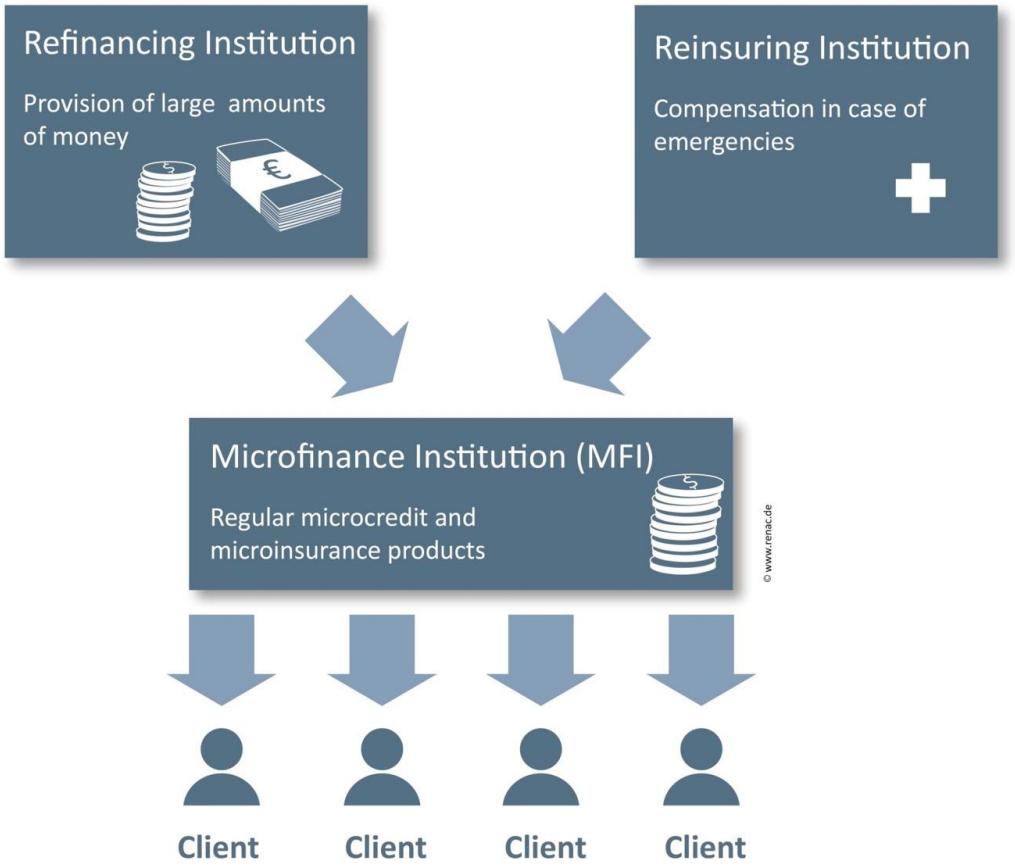
- Concessionary loans from development banks and other international donors.
- Market-priced loans from commercial banks.
- Cross-budget financing (from other microcredit lines in the same institution).

When developing green microinsurance schemes, reinsurance arrangements are important as they bear relatively high risks for the insurer (e.g. natural disasters can hit whole communities and regions and require huge repayments at once). Reinsurance is an arrangement where an insurance company, the "reinsurer", commits to provide compensation to an insurance company, the "insurer" (e.g., the MFI), for all or part of the risk under a specified group of insurance policies issued by the insurer. Reinsurance could:

- reduce the insurer's risk exposure;
- be a useful source of funding and actuarial experience; or
- help to stabilise profits and protect them against strong fluctuations.



Checklist for refinance



Principle of financing and refinancing

6.3.4 Internal processes and policies

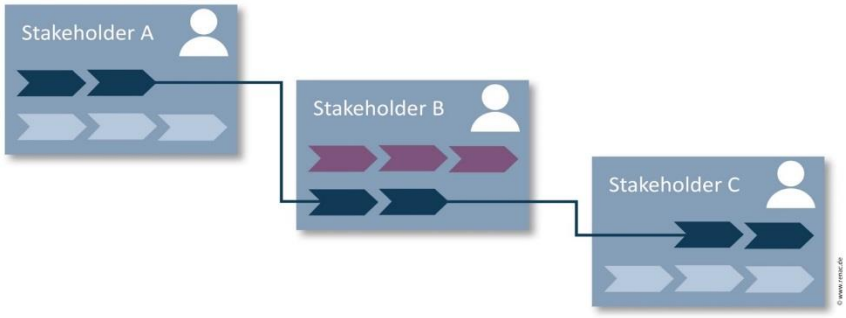
Learning objectives:

- Understand the necessity of clearly defined internal systems within each participating organisation/each partner

Once it is clear which green microfinance products and services could be offered (i.e. because they are demanded in the location/market and can be supplied), the precise operational framework for this to happen needs to be defined. This stage aims to promote internal capacity building to enable staff to implement and further develop green microfinance activities within each participating organisation.

It envisions the establishment of a multitude of internal procedures and flows within each of the participating microfinance institutions and providers. These will include client acquisition policies/loan approval flow, procedure for updating the design of the product, claims management system, training plan of sales and management staff, IT systems integration, etc.

Creating the right incentive scheme is also important. In contrast to usual microfinance products, green microfinance is perceived as being more complicated to sell to clients. Strong incentives should be created since the right financial and/or non-financial compensation set up would incentivize management and sales staff to engage in promoting and selling green microfinance products and services.



Internal processes and policies

6.3.5 External systems: workflow with partners

Learning objectives:

- Understand what external operational and communication systems need to be established to implement and further develop green microfinance activities between partners

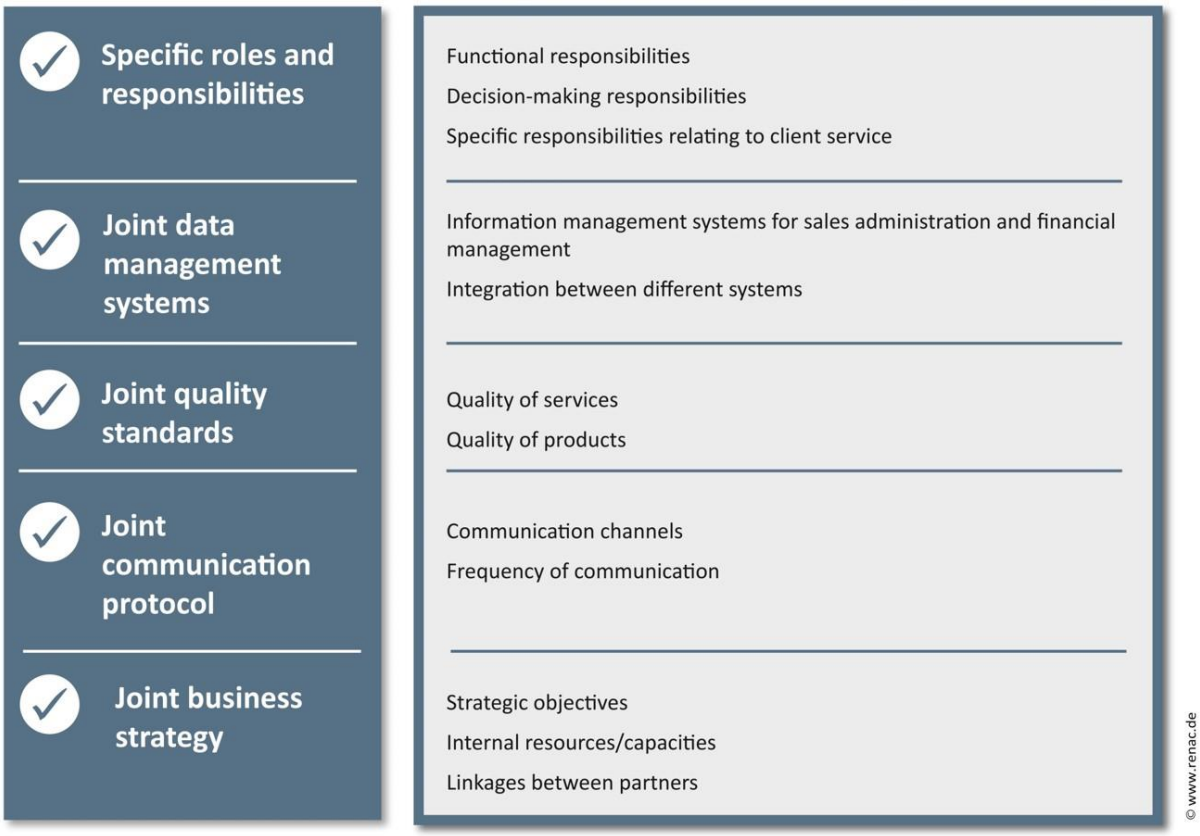
Before launching the green microfinance products and services, it is important to clarify the operational and external communication framework of the partnership structure. As green microfinance requires multi-stakeholder partnerships, clear definition of leadership roles and responsibilities is critical.

The specific roles and responsibilities of each partner should be clearly defined. This includes operational roles related to functional responsibilities, such as repayments/premium collection, but also decision-making responsibilities, such as approving the final product or the annual budget. Specific responsibilities relating to client service should be clearly understood and agreed.

Cost-effective administration systems and efficient data sharing mechanisms are important components of successful green microfinance schemes. IT/information management systems may be needed for sales administration and financial management. A lack of integration between systems either internally or between the partners can cause problems. In particular, details on the nature and scope of systems development, management of IT and other systems resources, and allocation of technology costs (both development and maintenance) need to be agreed on by the partners.

The partners should agree on the main lines of joint communication, and the frequency of regularly scheduled meetings.

The time for agreeing and outlining the workflow with partners will depend on the complexity of the proposed partnership and the number of stakeholders involved.



Checklist on workflow with partners

6.3.6 Strategy and business model development

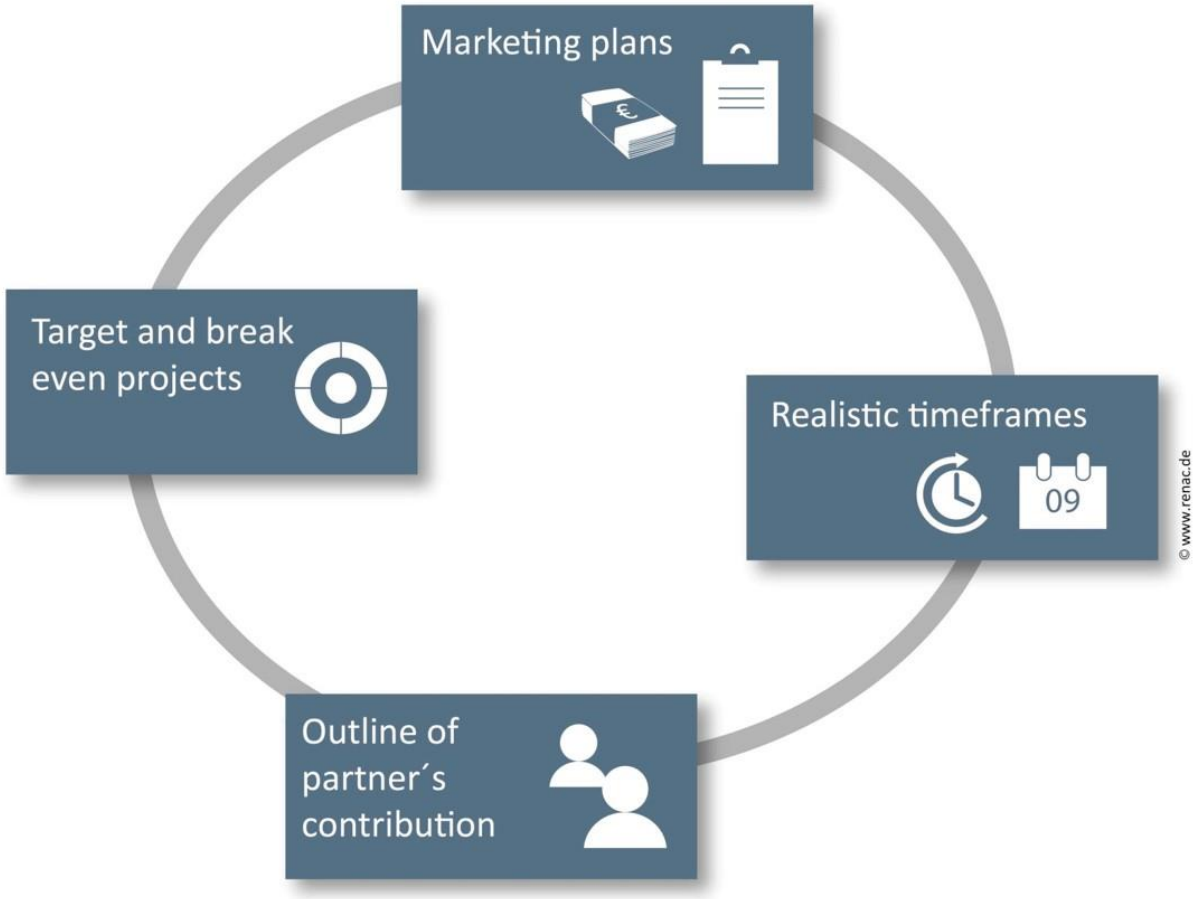
Learning objectives:

- Get to know components of a business plan for a green microfinance scheme

Before engaging in implementation of a green microfinance scheme, a joint business plan needs to be prepared. It should aim to summarise agreements on the financial expectations and projections for the programme. The business strategy and plan together summarise

- the strategic objectives of all major partners in the green microfinance scheme;
- their expected available internal capacities (e.g. financial, HR, infrastructural) to manage/finance green microfinance; and
- how they link to form expertise and/or processes for the delivery of selected green microfinance products and services.
- A business plan will include, among many components:
- targets and projections for product sales and business growth;
- break-even projections;
- marketing plans and expenses, as well as sharing of costs;
- outline of the contribution of each partner to expenses for systems development; and
- realistic timeframes and prescription on how the scheme is to become sustainable.

An important aspect of the business plan should be to set specific timeframes to monitor and report on progress, including appropriate decision points and evaluation triggers during the pilot phase. It should also set out the performance indicators that will be measured, including frequency, method and targets. The business plan should be prepared jointly in order to manage the expectations of all partners.



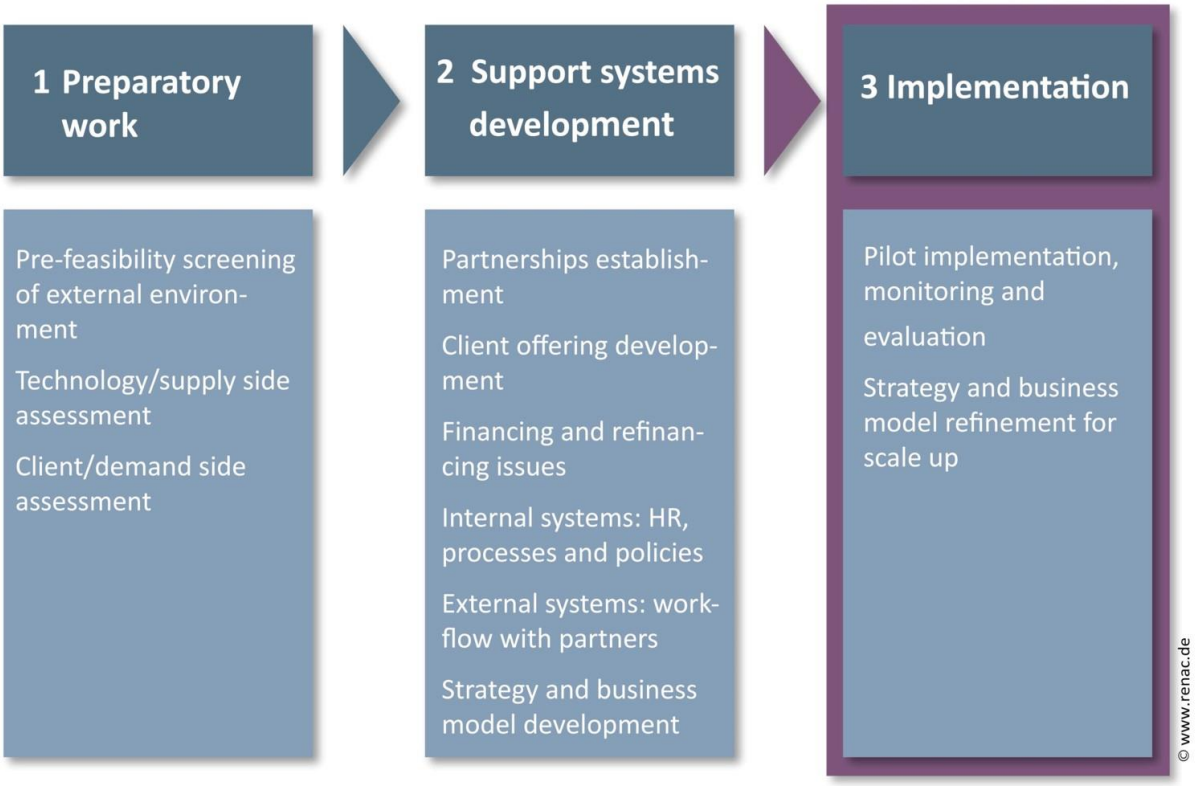
Principle of business plan development

6.4 **Implementation**

Learning objectives:

- Get to know the important factors and steps to consider when entering the practical implementation of a green microfinance scheme

Once the preliminary work and support systems have been developed, a green microfinance scheme can be launched. This would usually happen through a pilot phase that is then evaluated so that the lessons learned are incorporated as updates to the business plan of the scheme.



Third phase of a green microfinance project: Implementation

6.4.1 Pilot implementation, monitoring and evaluation

Learning objectives:

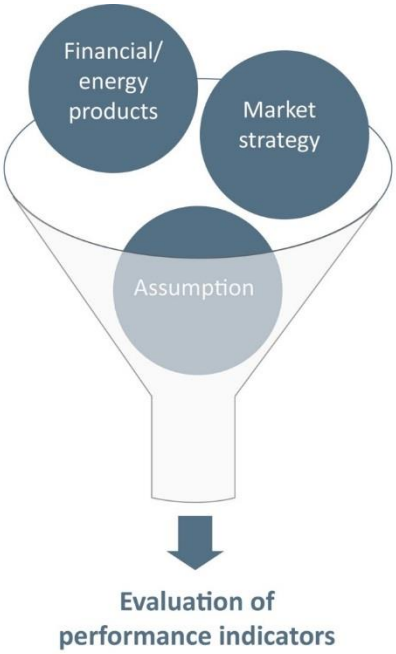
- Understand the aims of pilot projects
- Understand the aims of pilots project monitoring and evaluation

Once the preliminary work has been done and the support systems have been developed, the green microfinance scheme can be launched. This would usually happen through a pilot phase, limited to particular location(s), number of rolled-out products, and a specific timeframe. Pilots aim to:

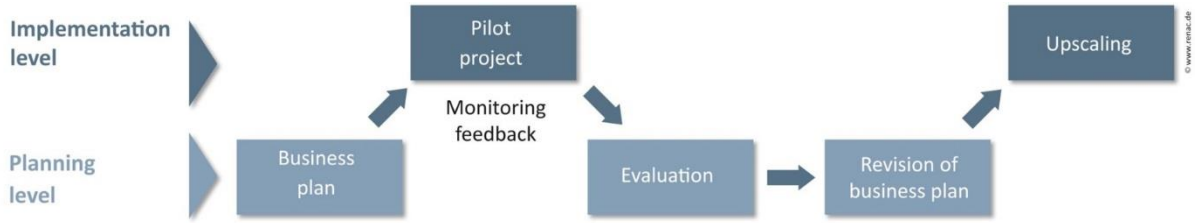
- Check the practical working of the developed business mechanisms
- Collect client feedback to avoid making major mistakes and/or to improve already successful ideas
- Give insight on what processes, procedures and assumptions need to be changed, adapted, and revised
- Act as role models for the future scale up of the green microfinance business
- Test how effective the marketing strategy is in reaching and informing the target client groups about the green microfinance product and in stimulating demand

Monitoring and evaluation activities are needed to measure the pilot project's quality and impact against the business plan and objectives of the green microfinance scheme. With respect to a green

microfinance partnership, it is important to also evaluate the success of the partnership itself, in addition to the business, socia, and environmental performance of the programme. Appropriate performance indicators that will be measured, including frequency, method and targets, should be clearly stated at the beginning of the pilot and agreed to jointly by the partners to ensure buy-in.



Funnel for the performance indicators



Principle phases of a pilot project

6.4.2 Strategy and business model refinement for scale up

Learning objectives:

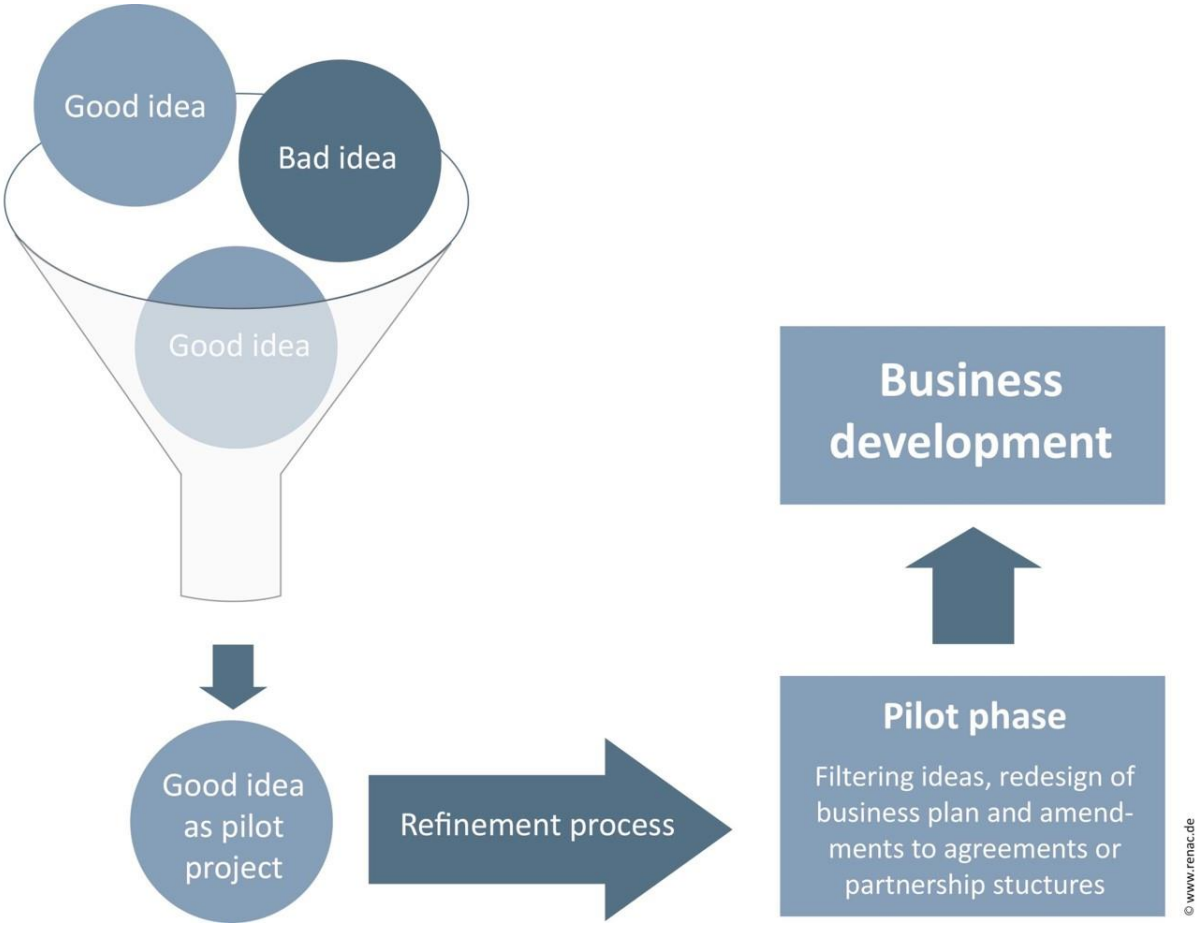
- Find out how the results of pilots feed into the development of green microfinance schemes

Green microfinance schemes typically start out as pilots, and product or process changes are frequently necessary.

Product re-design and changes in distribution channels might be necessary to find solutions to improve schemes and increase sales. Changes to the business model and plan might need to be implemented to adjust expectations, roles and responsibilities. Some changes may be minor revisions to the agreement that can be easily accommodated, others may be more complex.

Depending on the level of detail in the written agreements forming the partnerships that support the green microfinance scheme, these may also require corresponding amendments.

In some situations, the partnership structure may need to change, and one or more partners may be replaced to ensure the success and sustainable scale up of the programme.



Principle of piloting projects and business development

6.5 **Summary of the chapter**

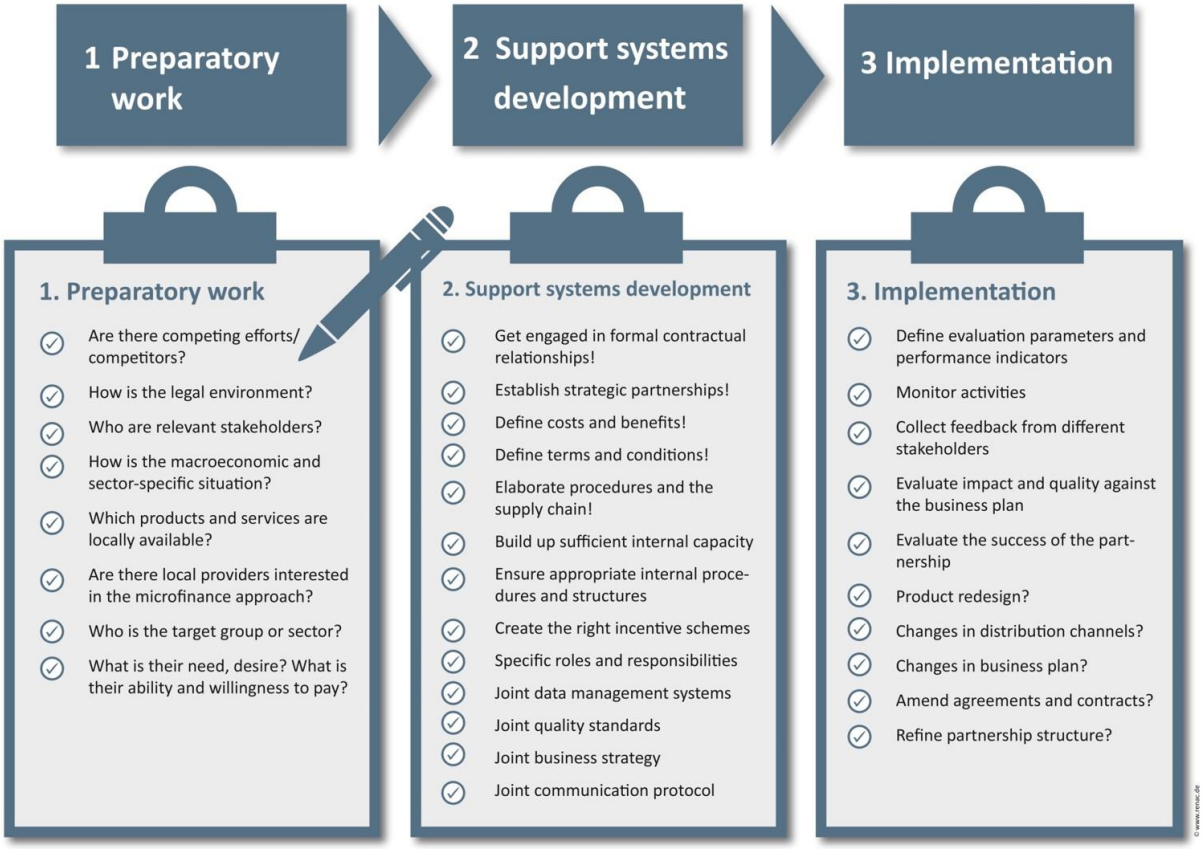
This chapter outlined the main stages in the preparation and implementation of a green microfinance scheme.

Before starting to offer green microfinance products and services, an initial overview of the target operation region/country needs to take place to establish if there is an enabling environment for green microfinance. A macro and micro analysis of the external environment needs to take place to establish the overall viability of the envisioned scheme.

Once it is clear which green microfinance products and services could be offered (i.e. because they are demanded in the location/market and can be supplied), the operational framework for this to happen needs to be defined. The development of support systems aims to ensure that the right conditions are in place to enable the practical and sustainable implementation of the envisioned green microfinance scheme.

Once the preliminary work and support systems have been developed, the green microfinance scheme can be launched. This would usually happen through a pilot phase, which would then be evaluated and the lessons learned would be incorporated as updates to the business plan of the scheme.

The presented checklist of actions is relevant for microfinance institutions, technical assistance providers/consultants, or donors who aim to directly implement or act as a driving force for the establishment of green microfinance schemes.



Complete checklist for green microfinance projects

7 Summary

7.1 Summary

Climate finance encompasses financing for avoiding GHG emissions (“climate change mitigation”), for the Reducing Emissions from Deforestation and Forest Degradation including conservation (REDD+) and for enhancing the resilience to the risks brought about by climate change (“adaptation”). Developed countries have committed to scaling up the transfer of climate finance funds to developing countries to USD 100 billion/year between 2020 and 2025. What actually counts into that and the relationship of this transfer to official development assistance has to be clarified by a UNFCCC commission until 2018.

Only about 12% of the necessary annual financing to prevent dangerous climate change beyond 2°C is considered additional to business as usual, whilst the remaining is simply greening business as usual investments, e.g. investing in solar rather than a coal power plant . Current estimates indicate that the investment shift necessary has not happened yet: total climate financing in 2014 reached USD 360 billion, falling far behind the estimated USD 5,700 billion of greened investment necessary. Current

climate financing is delivered via grants, concessional loans, market rate loans, balance sheet financing and risk guarantees.

There is a range of different sources of public and transnational climate finance, such as the UNFCCC mechanisms (GEF, GCF and AF) or Multilateral Development Banks (e.g. World Bank, EIB or ADB). Most of the funding is accessed by developing countries indirectly via development banks as the intermediary. Direct access by National Implementing Entities of developing countries is a new access form of funds like GCF and AF. Of utmost importance are domestic sources (e.g. from environmental taxes, freed by energy subsidy reforms, etc.). National funds can be a mechanism to blend domestic and donor funding.

Carbon markets are a tool for achieving domestic mitigation targets, for raising domestic financing, as well as for transferring financing from developed to developing countries using the flexible mechanisms of the Kyoto Protocol (CDM and JI). Carbon initiatives funded from public and private sources buy credits from CDM projects.

The private sector has the most important role in making its investments more sustainable and climate friendly. Among innovative financing instruments developed for private investors are the so-called YieldCos and Green Bonds. While Export Credit Agencies (ECAs) could support green private investment from developed countries in developing countries most have not switched their financing portfolio to climate investment yet.

Beyond – or in the absence of – existing regulations, voluntary carbon offsets offer the opportunity to voluntarily buy carbon offsets to take responsibility for neutralising caused emissions.

Regarding the way forward, the Paris agreement offers three future instruments for international climate finance: a) linking of carbon markets; b) “new mechanisms” that are likely to replace the Kyoto Protocol’s flexible mechanisms CDM and JI; and c) non-market approaches to sustainable development.

To successfully transform society to climate neutrality, it is useful to develop Low Carbon Development Systems (LCDS). A more detailed approach, often developed on the basis or within a framework of a LCDS, take Nationally Appropriate Mitigation Actions (NAMAs), which are climate mitigation actions at the project or policy level. Financing NAMAs is likely to be a combination of domestic and international funding.

Even though LCDS and NAMAs can take on various forms, and there are no stringent guidelines on which elements have to be included in a LCDS or NAMA, experience suggests the following: a NAMA should include a Measurement, Reporting and Verification (MRV) framework. MRV is a regular stocktaking of project key information, which helps to keep track of project/programme activities and achievements. Monitoring and Evaluation (M&E), which is a general management practice, goes beyond MRV activities. M&E is a targeted analysis of project achievements and experiences, which helps to analyse project/programme impacts and experiences for accountability, management and learning based on project experiences.

This course has also introduced the topic of green microfinance. The various examples of green microfinance projects in the developing world, covering both micro insurance and micro loans, show the different areas of activities and technologies that can be implemented. The essential steps involved in a green microfinance project were discussed, from preparatory work through to implementation. In any case, the projects have to be fitted to local conditions and stakeholders. This bottom-up approach underlines the idea that local stakeholders have to be involved in this topic. They should take responsibility on mitigation and adaptation actions in terms of deciding what to do with the money provided by global climate finance mechanisms.

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7.3 Further reading - Introduction to climate finance

- Climate financing tracking initiatives:
  - Bloomberg Climatescope: http://global-climatescope.org/en/
  - CPI Climate Finance Landscape http://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2014/
  - Tracking the 100 billion goal: http://www.oecd.org/env/cc/Climate-Finance-in-2013-14-and-the-USD-billion-goal.pdf
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- Further reading on investment needs:
  - Citi report (2015)
  - OECD (2012)
  - IEA (2015) World Energy Outlook. Special Report: https://www.iea.org/publications/freepublications/publication/WEO2015SpecialReportonEnergyandClimateChange.pdf
  - Rogelj, J., Luderer, G., Pietzcker, R.C., Kriegler, E., Schaeffer, M., Krey, V., Riahi, K. (2015): Energy system transformations for limiting end-of-century warming to below 1.5°C. 'Nature Climate Change' [DOI: 10.1038/NCLIMATE2572]

7.4 Further reading - Sources and mechanisms of climate finance

- Overview of the global climate finance architecture: http://www.germanclimatefinance.de/files/2015/12/cff2_2015_eng_global_cf_architecture.pdf
- Combined information on climate funds access modalities, sizes and focus: http://www.climatefundsupdate.org/
- Further guidance on direct access to the GCF: Germanwatch (2013) 'Enhancing direct access to the Green Climate Fund': https://germanwatch.org/en/download/7992.pdf
- Further guidance for National Climate Funds: UNDP (2011) *Blending Climate Finance Through National Climate Funds A Guidebook for the Design and Establishment of National Funds to Achieve Climate Change Priorities*: http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Change/Capacity%20Development/Blending_Climate_Finance_Through_National_Climate_Funds.pdf
- Energy subsidy: reform guidelines by IISD (http://www.iisd.org/topic/subsidies), subsidy data by IEA (http://www.worldenergyoutlook.org/resources/energysubsidies/)
- Climate bonds market updates: http://www.climatebonds.net/climate-bonds-initiative
- Innovative financing: Global Innovation Lab for Climate Finance http://climatefinancelab.org
- Carbon markets: State and Trends of Carbon Pricing: http://www.ecofys.com/en/project/state-and-trends-of-carbon-pricing/
- Critical views on the effectiveness of CDMs: http://carbonmarketwatch.org/learn-about-carbon-markets/intro-to-the-cdm/

- UNFCCC-Standing Committee on Finance – tracking future climate finance pledges: http://unfccc.int/cooperation_and_support/financial_mechanism/standing_committee/items/6877.php