Session 12

Climate Finance, and market-based Financial Instruments and De-risking

Suborna Barua, PhD
Professor of Finance, Department of International Business, University of Dhaka;
Financial Analysis Expert, International Climate Finance Cell Project, GIZ
+8801793111255, sbarua@du.ac.bd

CAPACITY BUILDING AND STRATEGY WORKSHOP

BRAC CDM | Savar | 2022

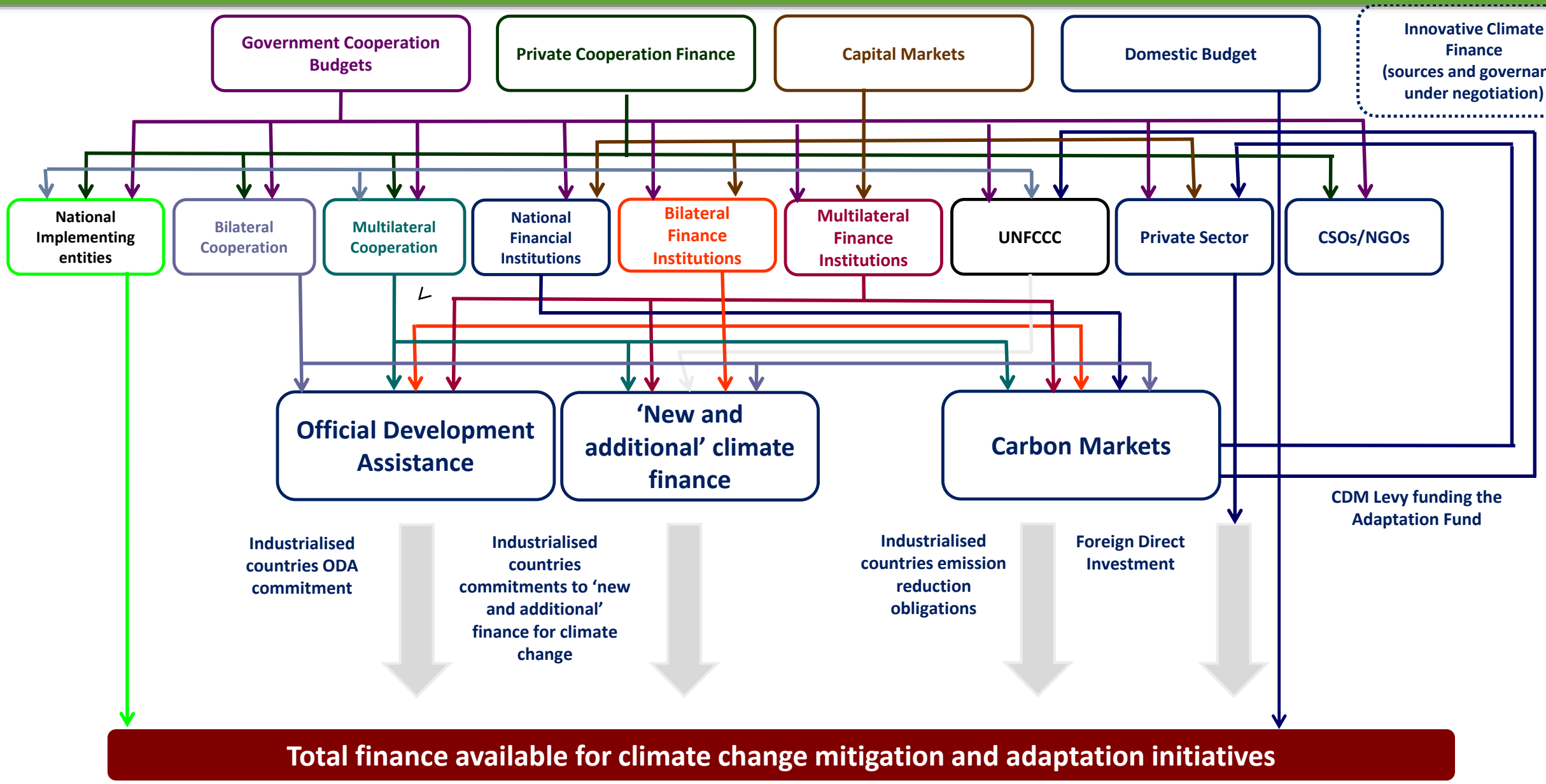
What is Climate Finance?

Climate finance is the use of financing instruments specifically aimed at reaching climate change mitigation and adaptation goals.

In other words, climate finance consists in any financial efforts to support the reduction and avoidance of further greenhouse gas emissions getting into the atmosphere but also helping people and countries to prepare and adapt to different climate.

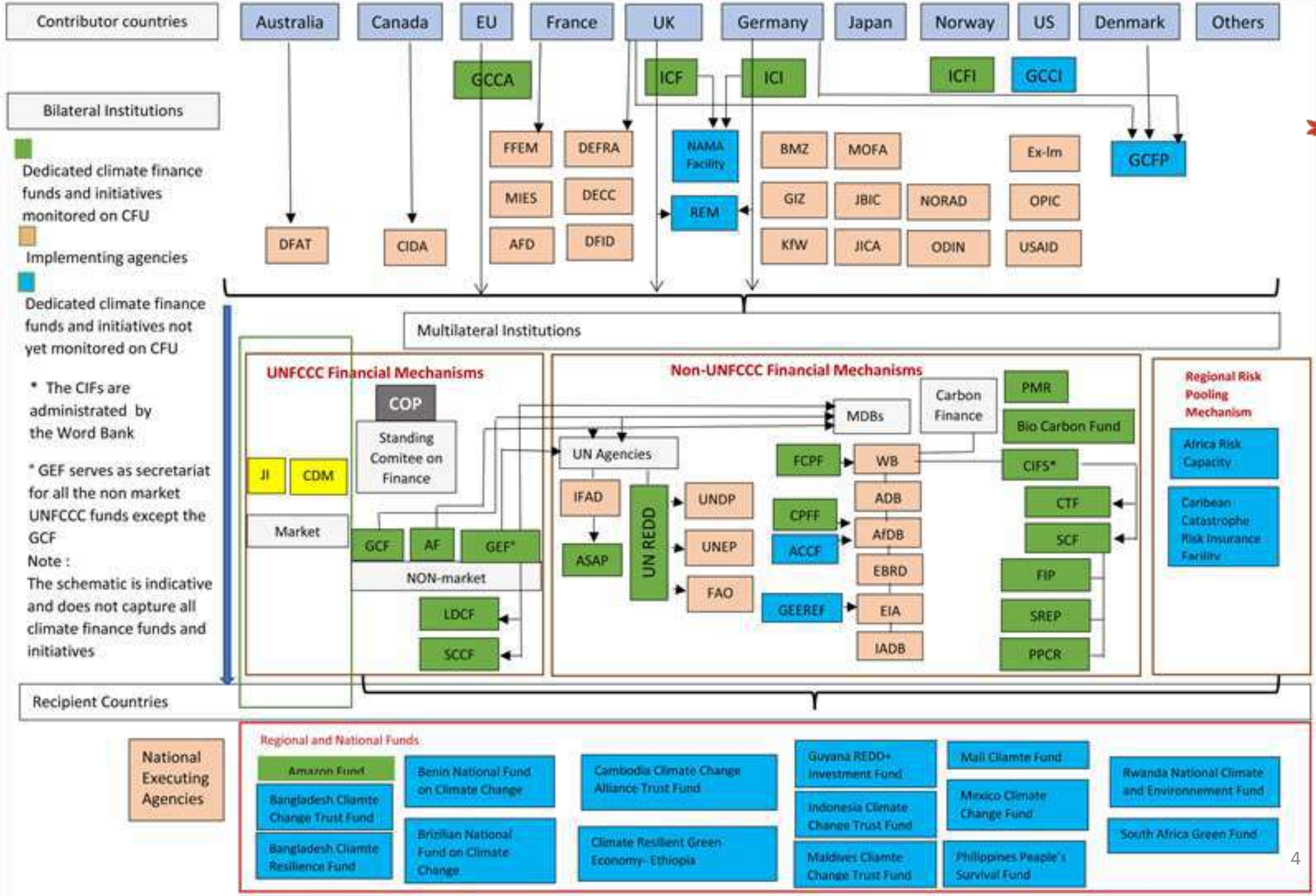
This concept has been around mostly since 1997 with the adoption of the Kyoto Protocol.

The Global Climate Change Financial Architecture



Source: Adapted from SEI 2009

The Global Climate Change Financial Architecture



Public and Private Investment Estimates of Climate Finance in LDCs

Investment Area	Investment Rationale	Public/ Private	Investment Estimate ($ tn p.a.)
Energy Transition			
Electricity generation, storage, and networks	• Solar/wind costs expected to decline by 30-60% by 2030 • Solar/wind deliver 3x more jobs vs. fossil fuels	Mostly private	1.5-1.6
Energy efficiency in buildings and industry	• Up to 50% building energy savings • 10-20% reduction in heavy industry energy usage • 9-30 jobs created per $1m invested in buildings energy efficiency	Private and public	0.6-0.8
Transport	• Electric vehicles (EV) offer 3-4x cheaper fuel • 6m new jobs in EV charging by 2030 • Short-haul electric flights expected to be cost-competitive with jet-fueled planes by mid 2030s	Private and public	0.1
Innovation (Hydrogen production, carbon capture)	• Hydrogen costs expected to decline by 50% or more by 2030 • $6-12bn green hydrogen export market by 2030	Private and public	0.06-0.07

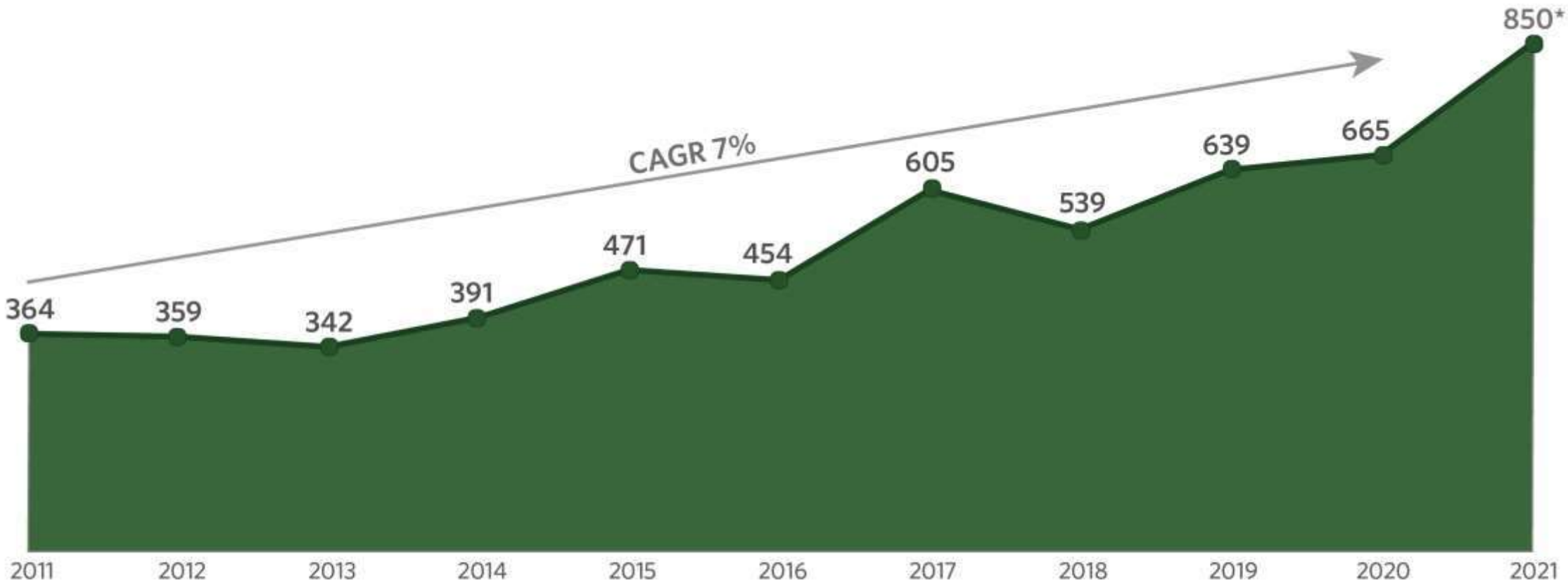
Source: STERN, 2021

Public and Private Investment Estimates of Climate Finance in LDCs (Cont'd)

Adaptation and Resilience			
Adaptation and resilience	• $7.1tn potential returns on $1.8tn investment • Reduce losses: flood damage costs $12tn p.a. in 2°C pathway	Private and public	>0.1-0.3
Nature, Agriculture, and Food			
Nature protection and restoration	• 45m jobs in sustainable land and ocean management by 2030 • Reduce $1.7tn in deforestation/degradation losses p.a. • Reduce zoonotic disease risk	Mostly public	0.1-0.25
Productive, sustainable, efficient agriculture	• $225bn p.a. opportunity in reducing food loss and waste • Alternative protein industry to grow to $85bn by 2030 • Soil degradation costs the EU $100bn p.a. • Enhance food security and improve nutrition • Help to reduce $3tn p.a. air pollution healthcare costs	Private and public	0.15
Total			**2.6-3.2**

Source: STERN, 2021

A Decade of Global Climate Finance Flows

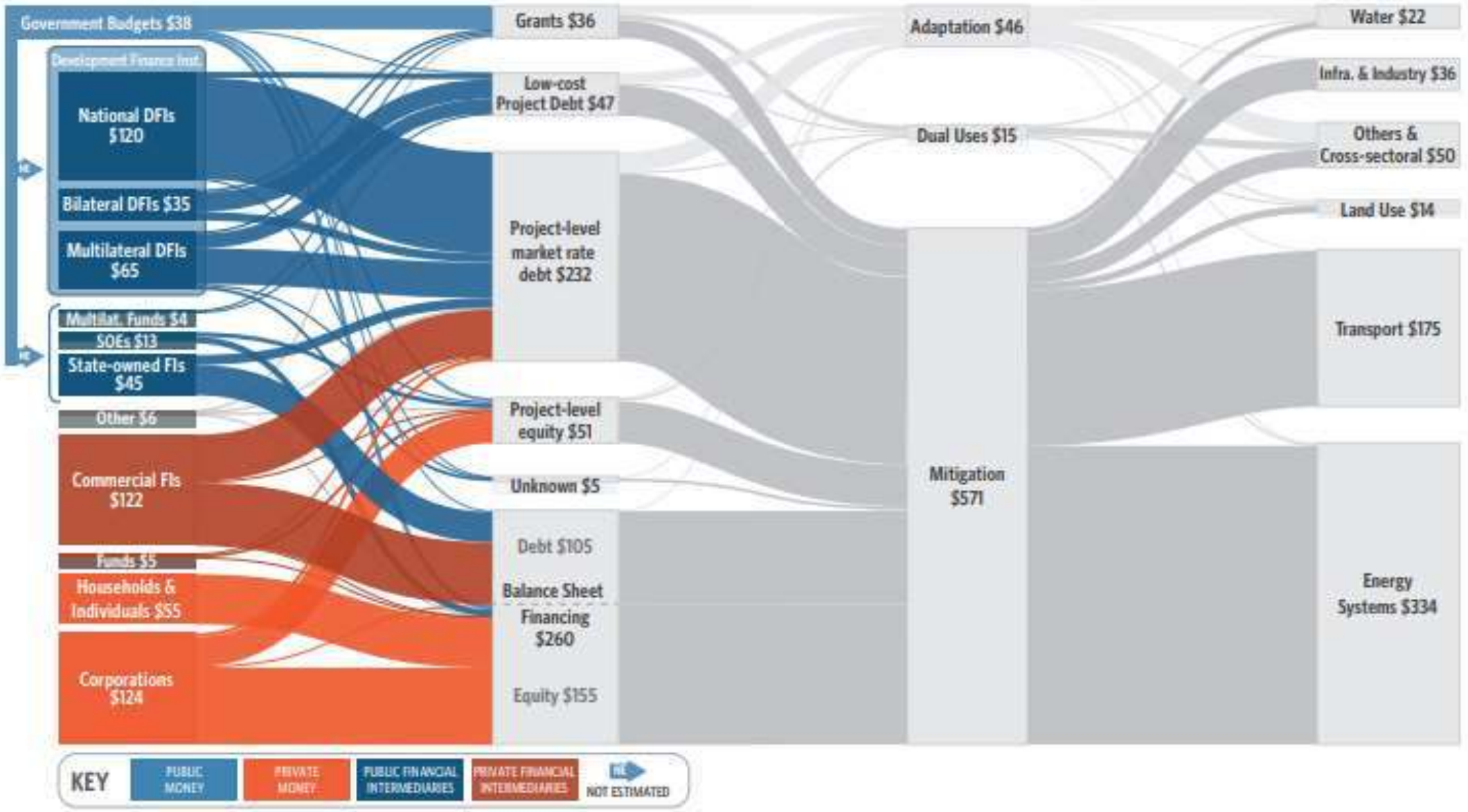


LANDSCAPE OF CLIMATE FINANCE IN 2019/2020

Global climate finance flows along their life cycle in 2019 and 2020. Values are average of two years' data, in USD billions.

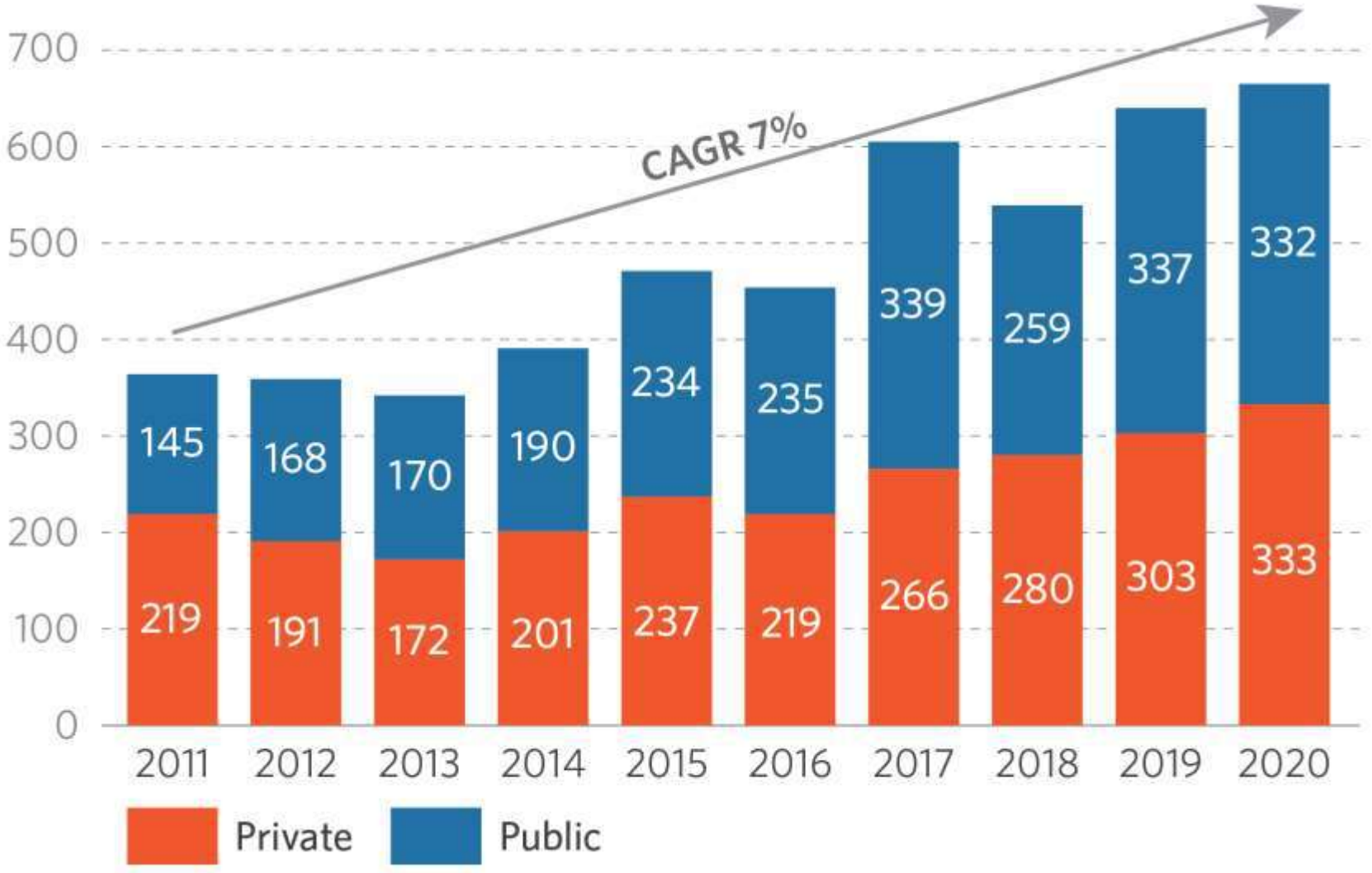
632 BN USD ANNUAL AVERAGE

CLIMATE POLICY INITIATIVE

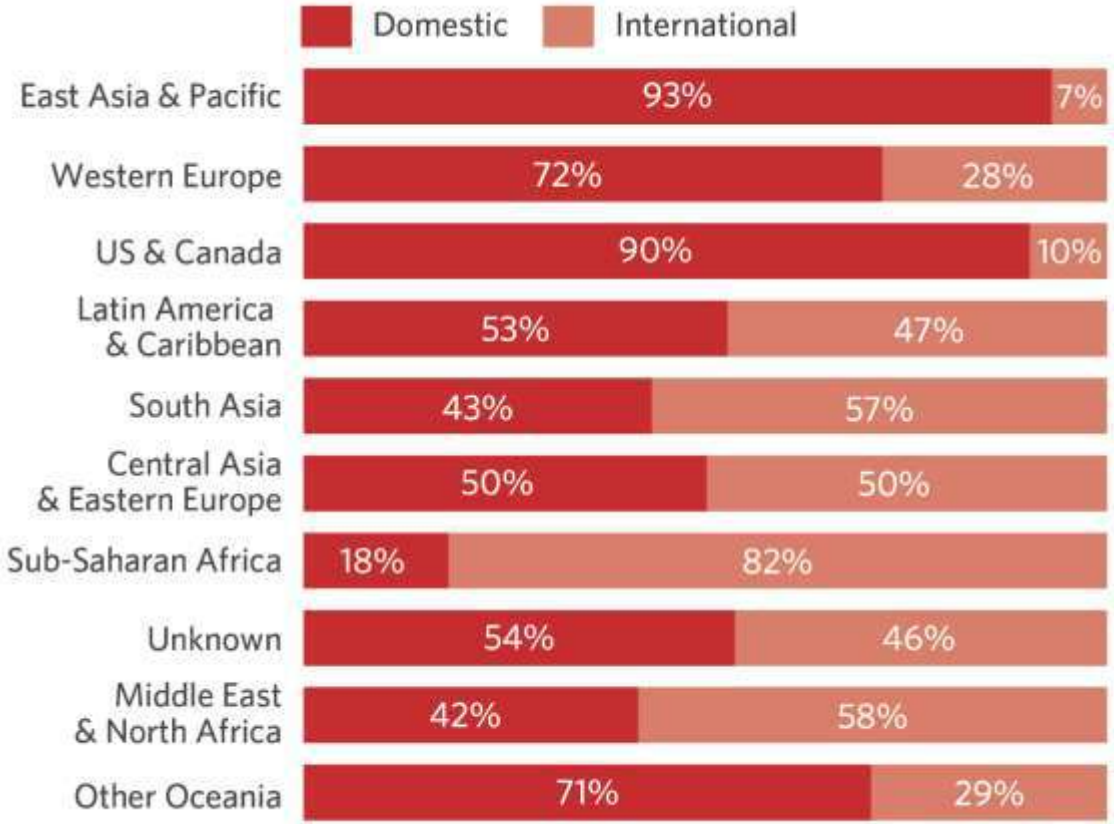


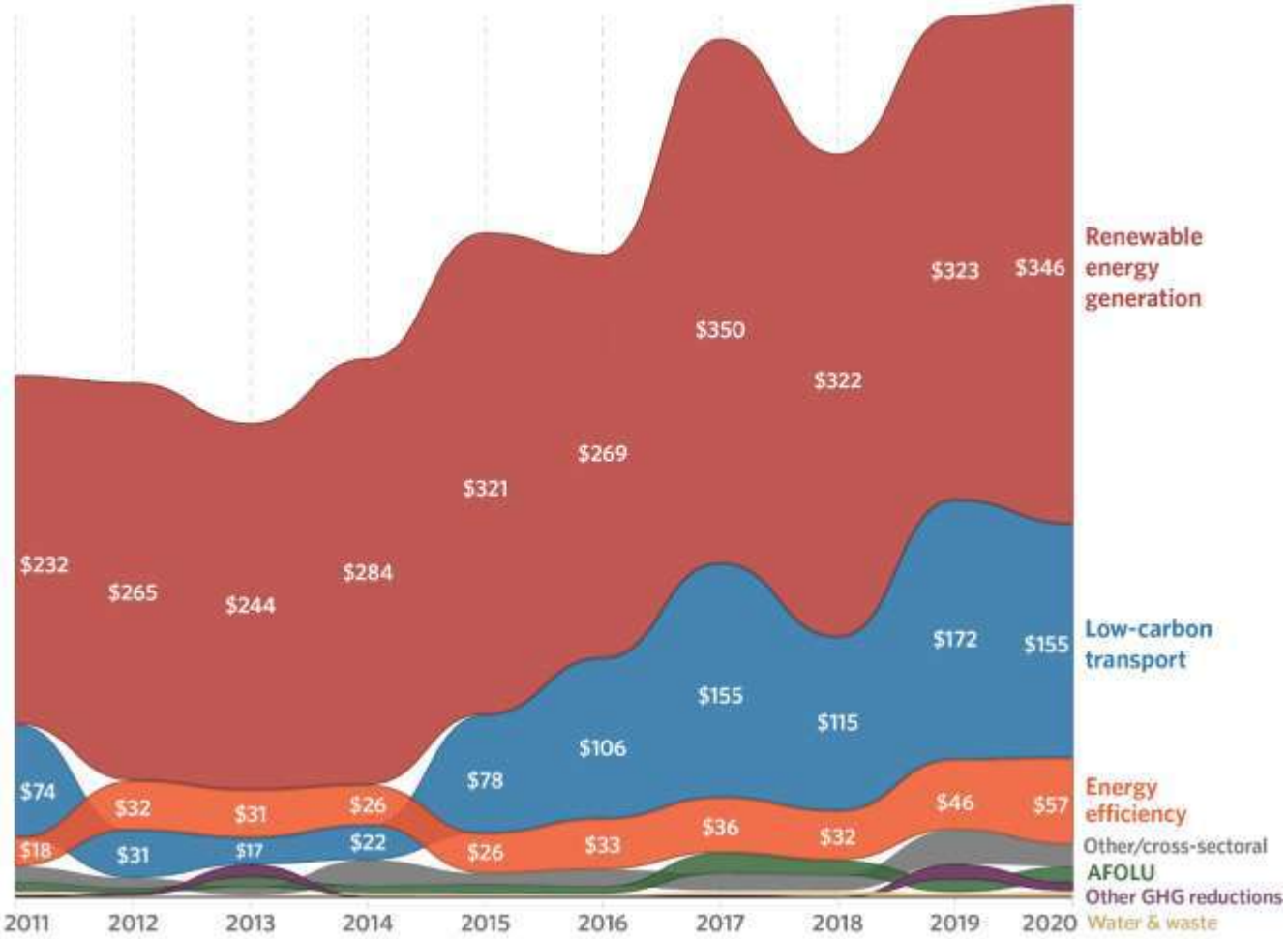
Sources: Climate Policy Initiative

Climate Finance Sources (Public vs. Private)

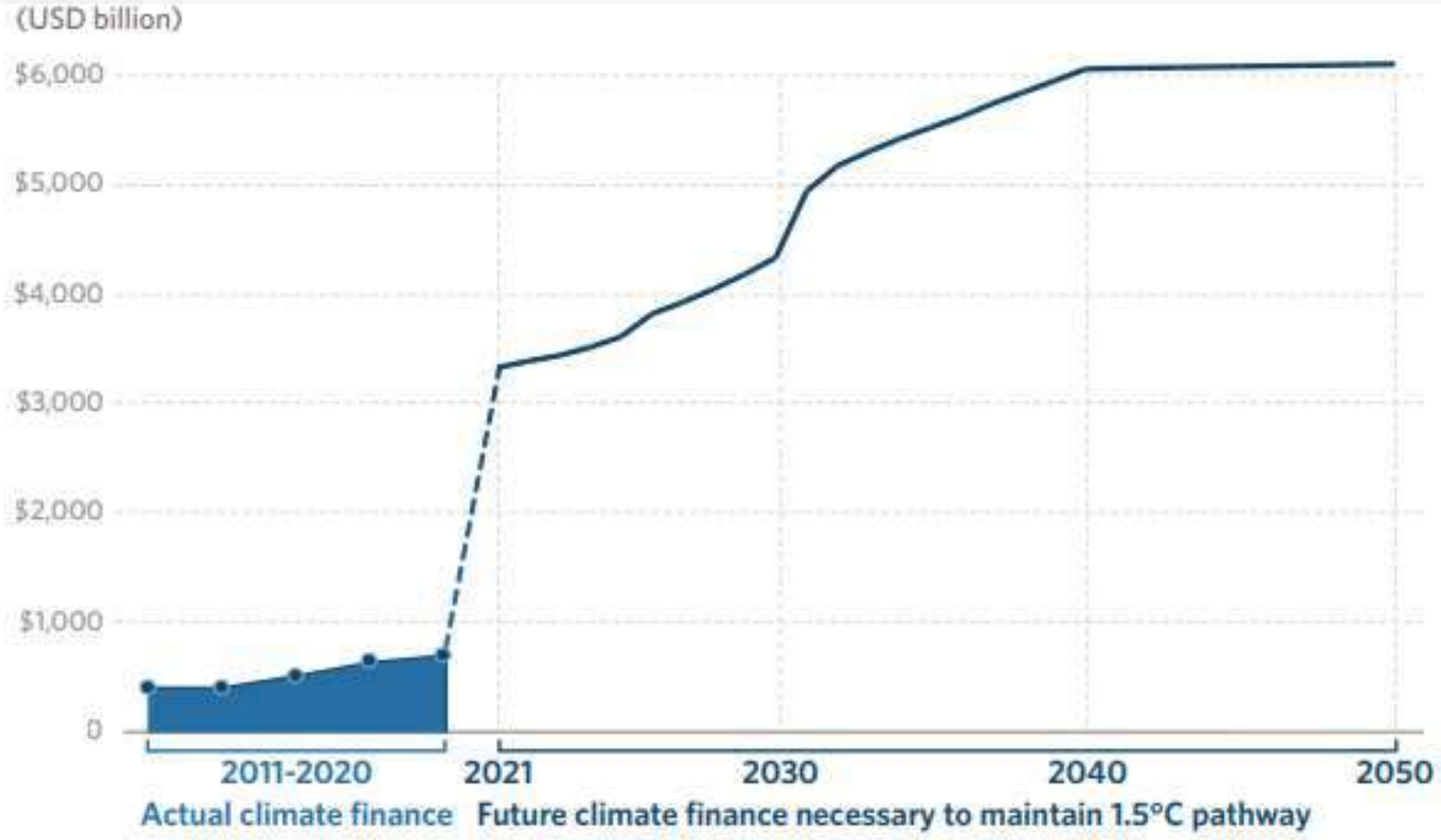


Climate Finance Sources and Utilizations





Climate Finance Fund Actual vs. Required



We need at least USD 4.3 trillion in annual finance flows by 2030 (CAGR 21%) to avoid the worst impacts of climate change.

Current and Potential Climate Finance Avenues

Capital Markets

1. International Sovereign Green Bonds
2. National Green Bonds
3. Blue Bonds
4. Transition Bonds
5. Sustainability-linked Bonds
6. Equity

Development Finance Institutions (DFIs)

1. Multilateral Development Banks
2. Bilateral Development Banks
3. Regional Development Banks

National Initiatives

1. National Funds
2. National Credit Enhancement Framework
3. National Green Infrastructure Bank
4. National Green Bond Framework

International Funds

Funds from Carbon Market

Alternative Funds

1. Venture Capital
2. Private Equity
3. Crowdfunding
4. Marketable funds (Hedge Funds/ETFs)

Current and Potential Climate Finance Instruments

Capital Market Instruments

Example

1. Green Bonds
2. Blue Bonds
3. Transition Bonds
4. Sustainability-linked Bonds
5. Catastrophe Bond
6. Resilience Bond
7. Nature Performance Bond

Senior
vs
Subordinated/Junior

8. Hedge Funds/ETFs/Mutual Funds
9. Green Equity

Alternative Funds

1. Venture Capital
2. Private Equity
3. Crowdfunding
4. Carbon Market

Green Lending

Example

1. Concessional
2. Non-concessional

Climate Risk Insurance

Example

1. Crop Insurance
2. Disaster Insurance
3. Climate Indexed Insurance

Climate Derivatives

Example

1. Climate Swap
2. Climate Options
3. Climate futures
4. Climate forward

Green/Climate Bonds

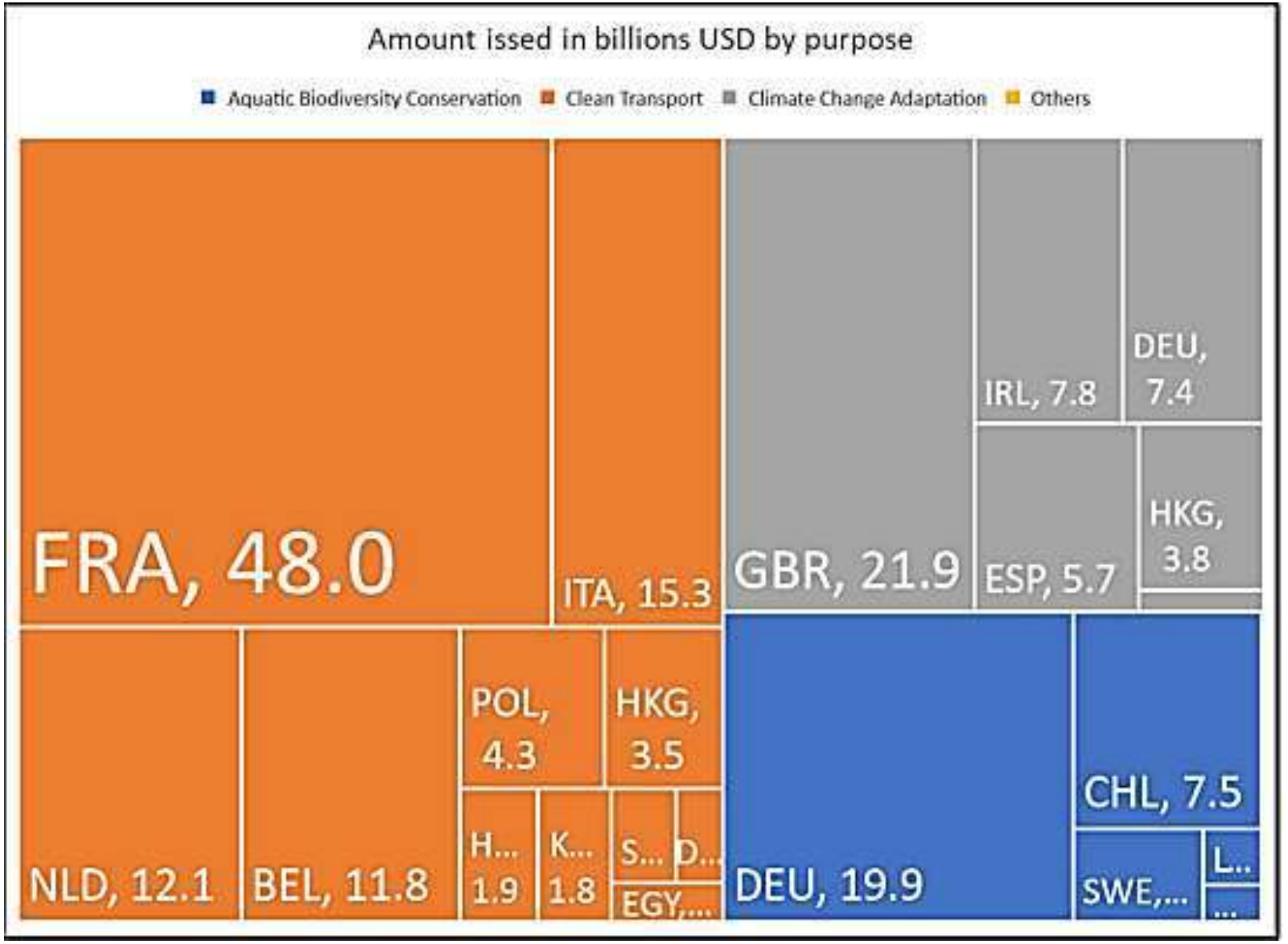
- A green bond is **a fixed-income instrument designed to support specific climate-related or environmental projects**.
- Green bonds refer to debt securities issued to raise capital earmarked for green projects.
- Green bonds **raise funds for new and existing projects which deliver environmental benefits, and a more sustainable economy**
- **Green bonds that are purely aimed at climate actions/projects are Climate Bonds**

Total Green Bond Market up to 2022

$1.989tn



Green Bonds Issuance Based on Purpose



Source: Eikon and IMF staff calculations

Sustainability-linked Bonds

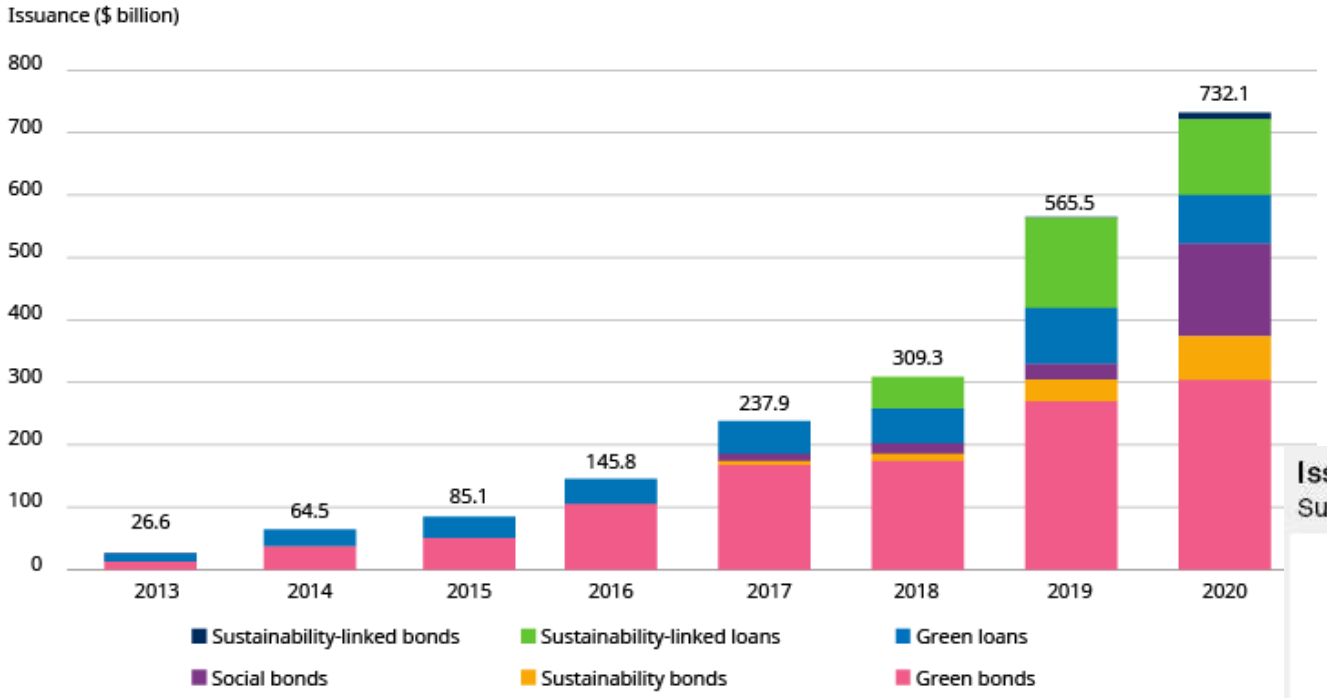
Any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ ESG objectives.

– Forward-looking performance-based instruments.
– Issuers commit explicitly to future improvements in sustainability outcome(s) within a predefined timeline. – Objectives are (i) measured through predefined Key Performance Indicators (KPIs) and (ii) assessed against predefined Sustainability Performance Targets (SPTs).

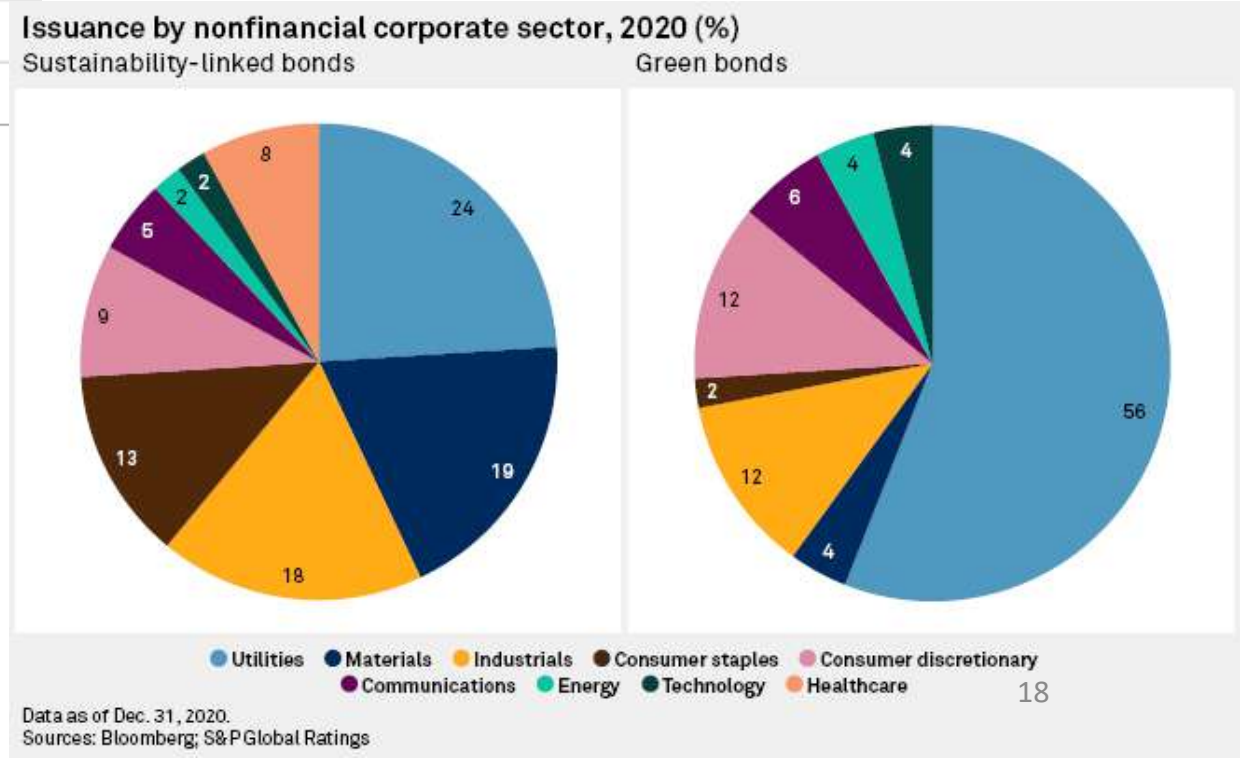
- Sustainability-linked bonds aim to further develop the key role that debt markets can play in funding and encouraging companies that contribute to sustainability (from an environmental and/or social and/or governance perspective.

- The Sustainability-linked Bonds Principles are issued by the International Capital Market Association (ICMA).
- Examples: https://www.bourse.lu/lgx-displayed-international-bonds?bonds=slb

Sustainability-linked Bonds Issuance



Source: BloombergNEF, Bloomberg LP. 601176.



Catastrophe Bonds (cat bonds)

- A catastrophe bond is a debt instrument that allows the cedent (the insured) to get funding from the capital market, if and only if catastrophic conditions, such as an earthquake or hurricane, occur.

- From an economic point of view, the instrument insures the cedent against the loss from catastrophic events (called peril) by shifting risks to the holders who bet on the nonoccurrence of catastrophic events.

- The insurance against natural disasters can be considered an adaptation policy for countries with exposure to climate change risks.

- Typically issued by State Insurance Companies/Governments

Example: World Bank Catastrophe Bond Transaction Insures the Republic of Philippines against Natural Disaster-related Losses Up to US$225 million

Hypothetical Example of a Catastrophe Bond

- Let's say that State Farm Insurance, one of the largest mutual insurance company in the United States, issues a CAT bond. The bond has a $1,000 face value, matures in two years, and pays an annual interest rate of 6.5%. An investor who buys the CAT bond will receive $65 each year and the principal will be returned at maturity. Issuance of the CAT bond raised $100 million in proceeds, which was placed in a special account.
- The bond is structured so that a payout to State Farm occurs only if the total natural disaster costs exceed $300 million for the two years. Any remaining funds would be returned to investors at the bond's maturity.
- During the course of the second year, a series of natural disasters occur for a total cost of $550 million. This activates the payout to State Farm, and $100 million is transferred to the insurance company from the special account.
- Investors who held a $1,000 CAT bond earned $65 in interest in year one then lost their principal in year two. State Farm reduced their cost for the natural disasters from $550 million to $450 million by issuing the CAT bond.

Resilience Bonds

- The use of proceeds of resilience bonds are earmarked for projects that increase resilience to climate change, e.g. sea walls to combat sea-level rise or building shelters in cyclone and typhoon-vulnerable areas.
- If there is no trigger event over the lifetime of the bond, investors recoup their principal investment as well as their regular coupon payments.
- If there is a trigger event over the lifetime of the bond, investor will lose their principal investment as well as their regular coupon payments.

Example

✓ World's first dedicated climate resilience bond, for US$ 700m, is issued by EBRD
✓ Proceeds to finance investments in climate resilience projects
✓ Launch follows adoption of Climate Resilience Principles by the Climate Bonds Initiative (CBI)

Nature Performance Bonds

Tied to measurable targets for restoring wetlands, protecting forests, and reducing threats to wildlife and plant species, but would allow for general use of proceeds (F4B 2020).

They would incentivize nature performance by offering a reduction in coupon and the potential for a principal adjustment on full delivery of the targeted nature and climate outcomes

Example

Pakistan tried to raise US $1 billion in nature-based bonds which is Pakistan's first-ever green bonds, which sought $500 million for clean-energy projects in May, 2021.

Equity – How is it different from Bond

Equity vs Debt Financing



Equity

Advantages



Debt

1) Less risky than debt
2) No future obligations
3) Gain investor network
4) No fixed timeline

1) Retain ownership
2) Interest is tax deductible
3) No future obligations
4) Variety of terms/rates

Disadvantages

1) Shared decision making
2) Potentially more expensive
3) Investor pressure

1) Must repay in future
2) Usually requires collateral
3) Impacts cash flow

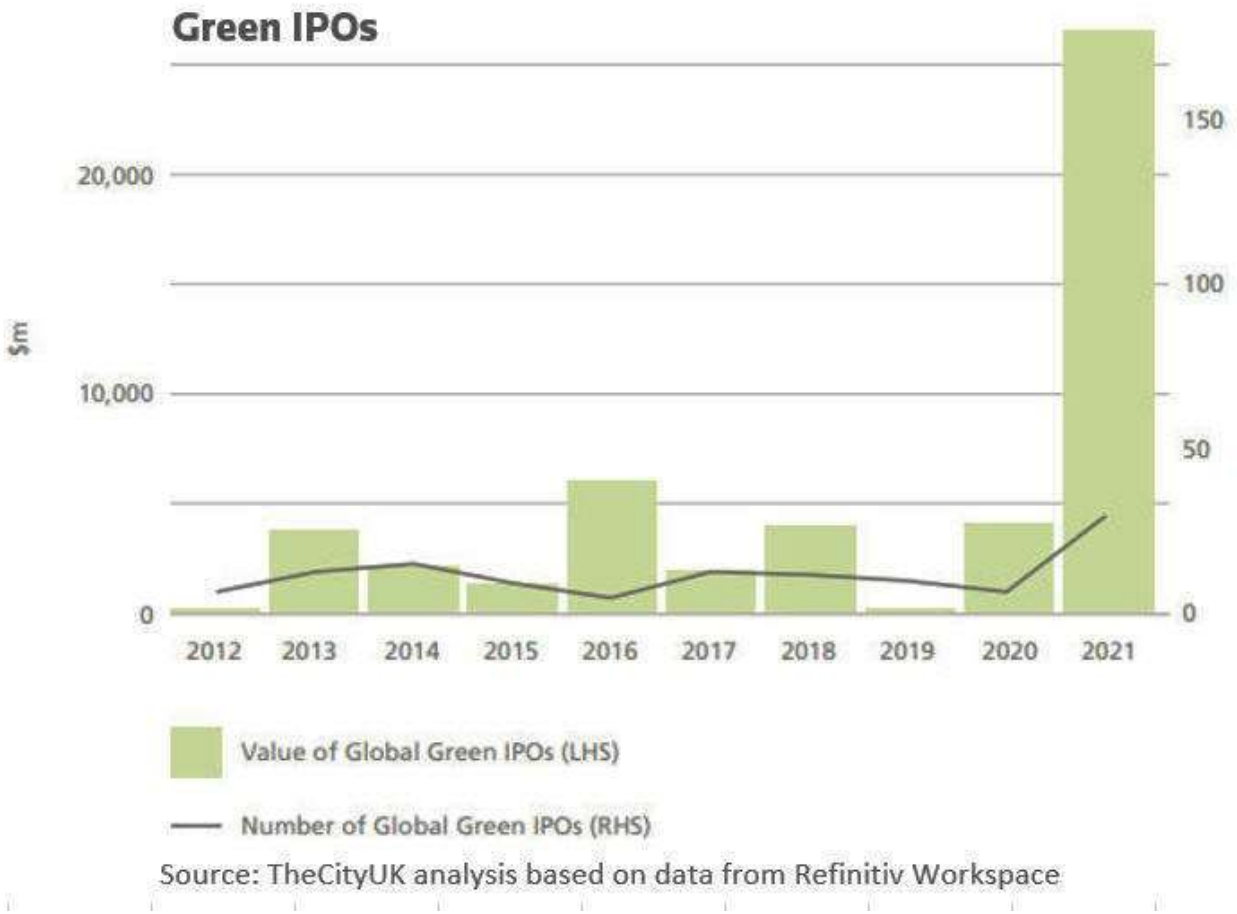
IFC's Green Equity Approach: 10 Principles

Table 1: IFC's coal and climate criteria for existing and new equity investments

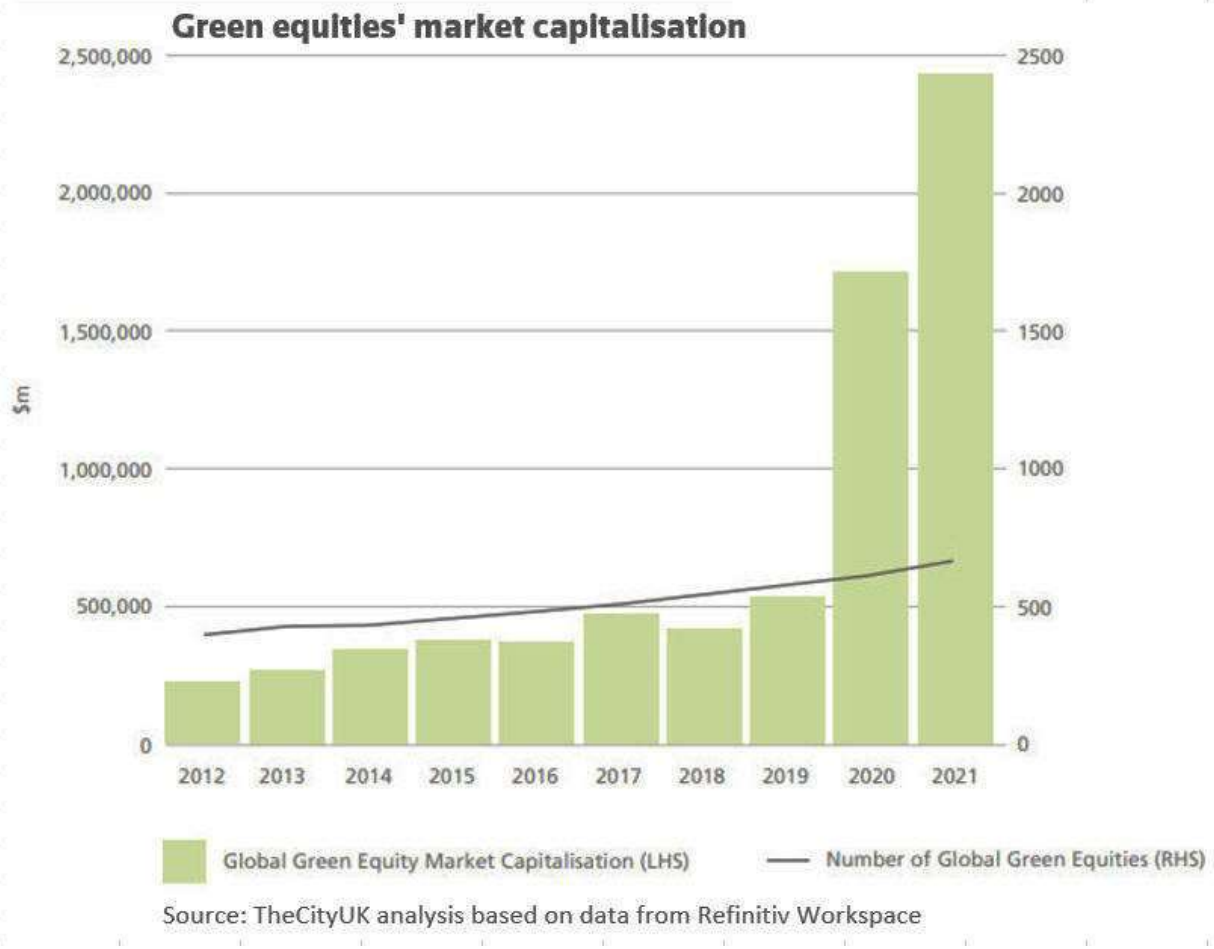
Criteria	Existing equity clients (no new business)	Existing equity clients (with new business)	New equity clients
Maximum threshold of coal exposure at investment	No maximum threshold requirement	No maximum threshold requirement	<15% exposure to coal-related activities
Coal exposure by 2025	Reduced to or kept at 5% of total loan portfolio	Reduced by 50% or no more than 5% of total loan portfolio (whatever is stricter)	Reduced by 50% or no more than 5% of total loan portfolio (whatever is stricter)
Coal exposure by 2030	Zero or near zero	Zero or near zero	Zero or near zero
Climate target by 2030	30% or country-specific target	30% or country-specific target	30% or country-specific target

Source: IFC. 2019

Green Equity Financing

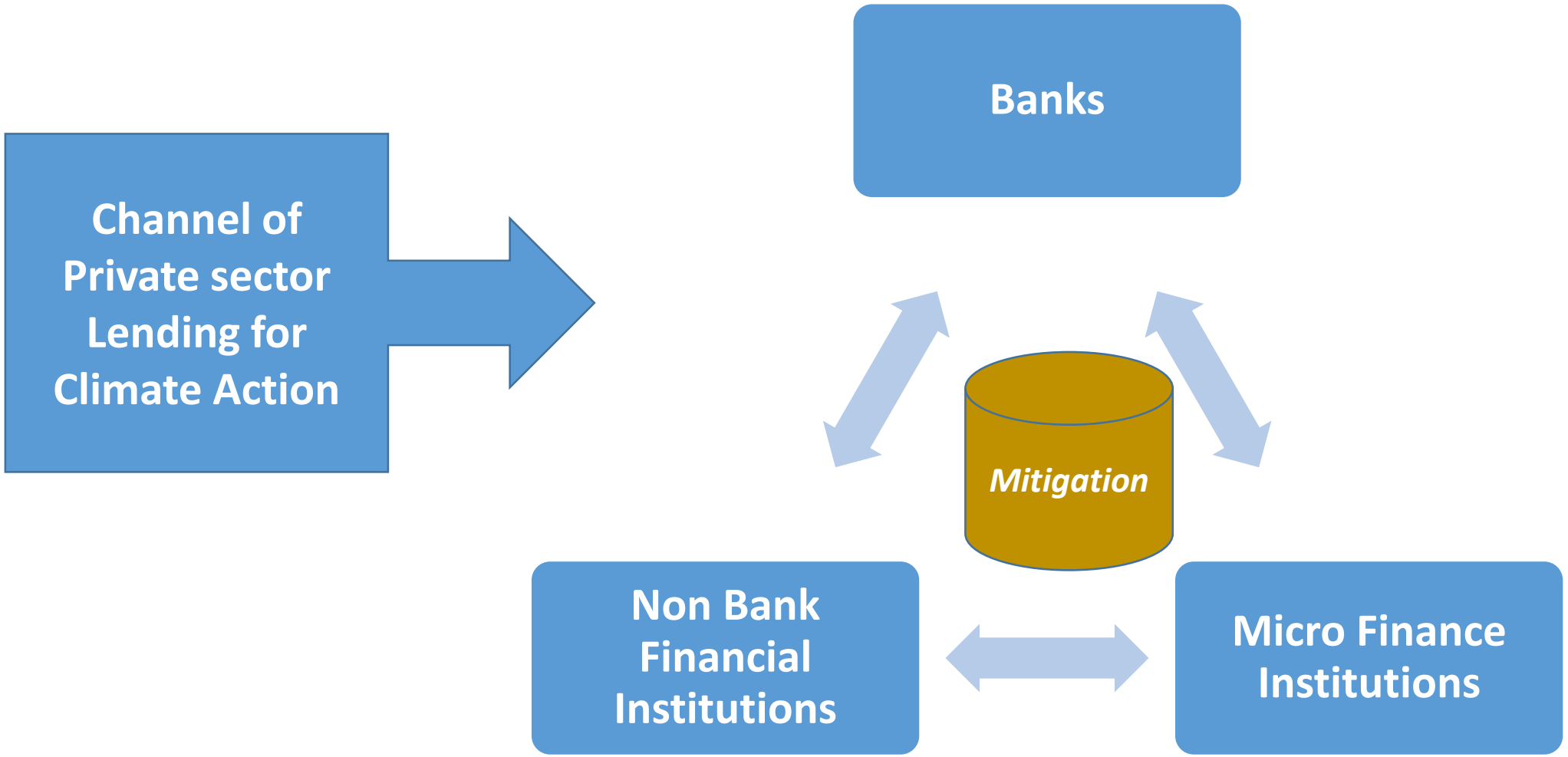


Source: TheCityUK analysis based on data from Refinitiv Workspace

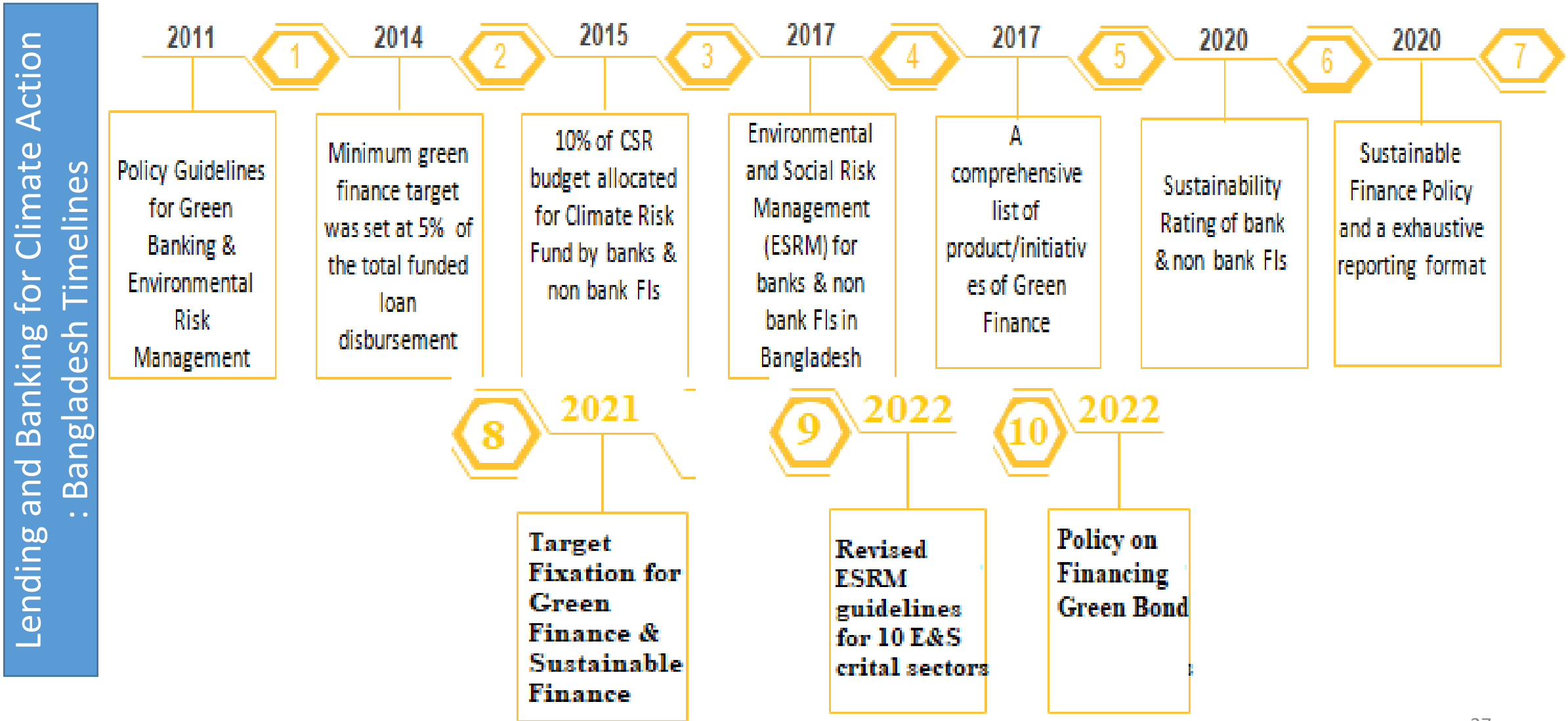


Source: TheCityUK analysis based on data from Refinitiv Workspace

Green and Sustainable Lending



Green Banking - Bangladesh



Green and Sustainable Lending - Bangladesh

Concessional refinance schemes addressing climate change impacts

Green Transformation Fund (GTF)

- 200 million US dollar & 200 million Euro
- Import of Green Capital Machineries

Refinance Scheme for Green Products/Projects/Initiatives

- BDT 4 billion
- 68 green products/projects/ initiatives

Shariah-based Refinancing Scheme for Green Products

- 1.25 billion

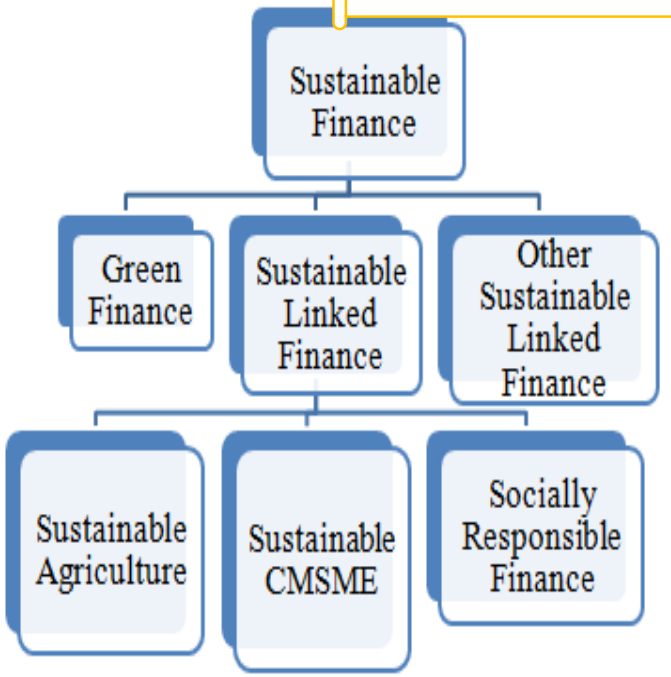
Technology Development/ Up-gradation Fund for export oriented industries

- BDT 10 billion
- 11 categories of environment friendly & energy efficient initiatives

Refinance for Mitigation Projects

Sustainable Finance Policy of Bangladesh Bank

Sustainable Finance Policy towards climate action



Sustainable Finance (SF)

The form of financial service that includes investment, insurance, banking, accounting, trading and financial advice integrating ESG criteria into the business or investment decisions for lasting benefits of both clients and society at large

Green Finance (GF)

- Promoting environment and resource conservation by reducing consumption of resources by means of operations
- Increasing the usage of greener technology through lending products

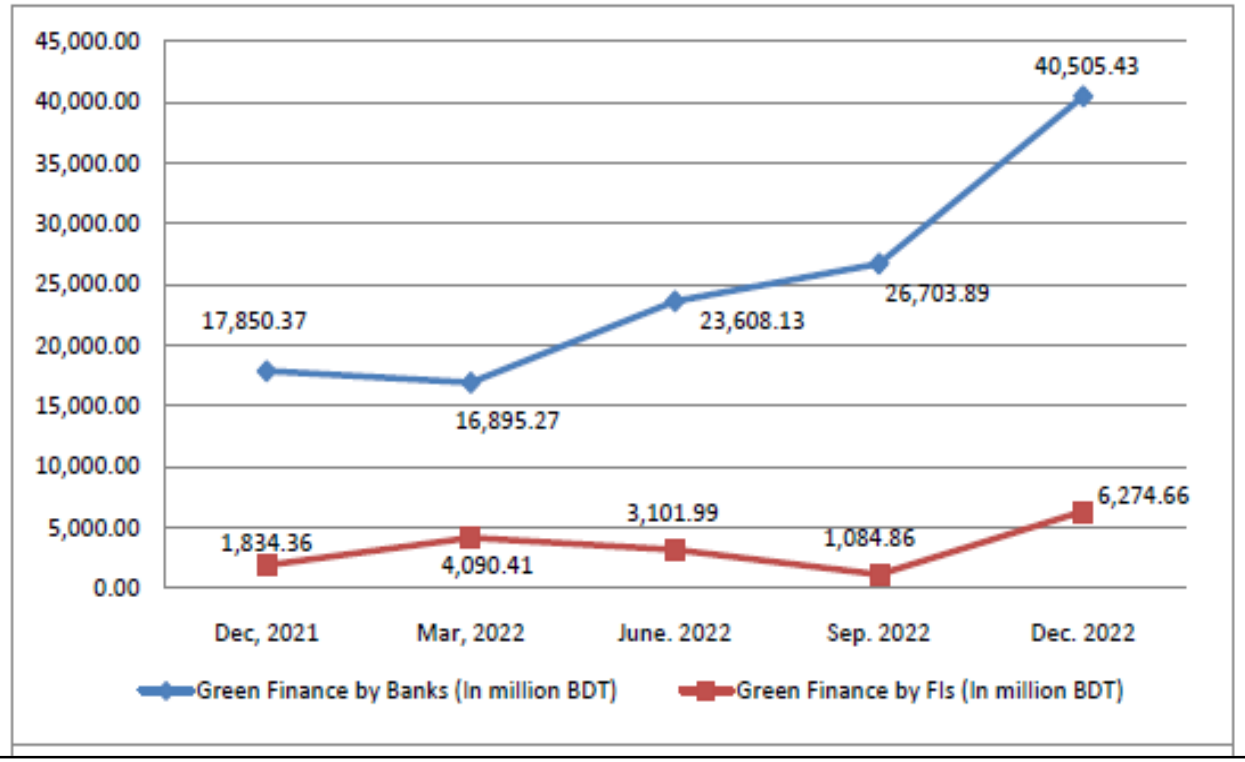
1	Renewable Energy	7	Environment Friendly Brick Production
2	Energy & Resource Efficiency	8	Green/Environment Friendly Establishments
3	Alternative Energy	9	Green Agriculture
4	Liquid Waste Management	10	Green CMSME
5	Solid Waste Management	11	Green Socially Responsible Finance
6	Recycling & Manufacturing of Recyclable Goods		

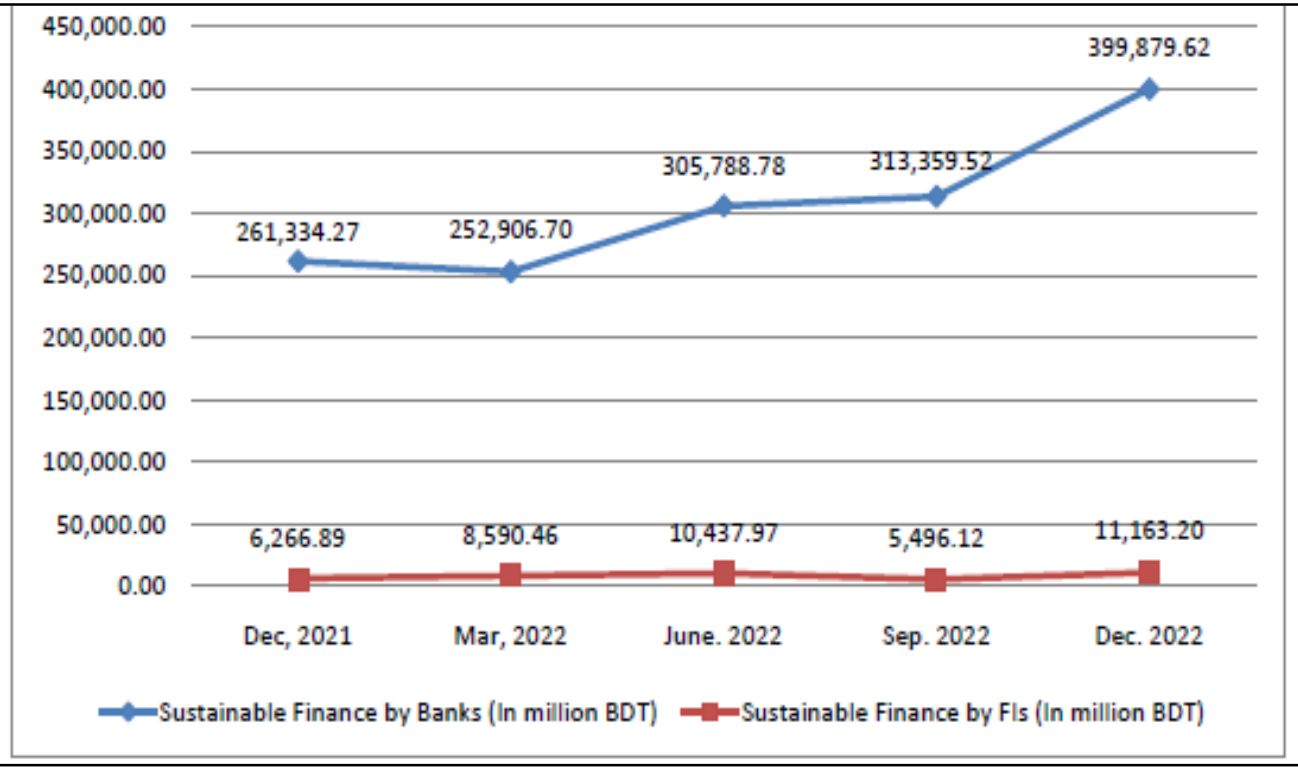
- 11 Green Sectors
- 68 Green Products/Projects/ Initiatives

For Mitigation: 53 Products/Projects/Initiatives

For Adaptation: 15 Products/Projects/Initiatives

Green and Sustainable Lending - Bangladesh





Alternative Financing for Climate Actions

- Private Equity
- Venture Capital
- Crowdfunding
- Mutual Funds

De-risking Climate Impacts

Insurance in Climate Resilience

- Insurance need to be integrated into other resilience and adaptation measures as part of a comprehensive climate adaptation strategy.
- Climate risk insurance policies increase resilience.
- They are useful tools for compensating instantaneous losses; providing resources for reconstruction, future production, reducing income inequality, motivating people to rebuild, and enhancing investment potential.
- Having advanced knowledge on risk exposures, analysis of risk data and pricing risk, Insurers can contribute to the pre-loss risk mitigation by providing advice to insured.

What Can Be Covered?

- Insurance schemes hedge weather-related risks and losses with regards to life, health, crop, livestock, livelihood, and infrastructure.
- Parametric or index-based insurance products are useful in reducing administrative costs of providing the products.
- Leveraging satellite, App and automated weather station data, insurers can assess loss and compensate policy holders instantaneously.
- Limited experience in Bangladesh shows that once the Insured get the compensation timely & without hassles, their confidence in the insurance schemes builds up and they want continuing coverage.

Climate Insurance Examples

- ❑ Many innovative and groundbreaking work is going on in developing countries; some are:
- In Malawi, an insurance product protecting farmers against drought is offered bundled with loan to foster investment in improved seeds. In case the associated drought index exceeds a specified level, the lender receives an insurance indemnity.
- In Peru, microfinance institutions are covered by index-based insurance, protecting them from loan defaults in response to crop losses due to heavy rainfall and flooding.
- In Vietnam, creditors are protected from default risk due to excess water levels as indicated by measurements at a hydrological station.

Climate Insurance Examples

- In Nepal, the *Shikhar Insurance Company*, is providing agriculture insurance products since 2012
- In Thailand, *SOMPO Insurance Pcl.* with *Bank for Agriculture and Agricultural Cooperative* is providing parametric weather insurance for Longan (a fruit) farmers from 2019.
- In Sri Lanka, the *Ceylinco General Insurance* is providing Agricultural Insurance since 2000 through Farmers' Societies and Financial institutions along with Personal Accident Insurance and farming equipment coverage.

Climate Insurance in Bangladesh

IFC-Green Delta weather index based crop insurance (WIBCI)

Oxfam-Pragati Insurance Later GD-WFP-OXFAM Flood Insurance

Frankfurt School of Finance and Management / InsuResilience / Syngenta Foundation Crop Insurance

SBC-ADB-Basix weather index based crop insurance

BRAC / GDIC Cattle Insurance

Proshika's Participatory Livestock Compensation Fund (PLCF)

Climate Derivatives

- Weather derivatives are financial instruments that can be used by organizations or individuals as part of a risk management strategy to reduce risk associated with adverse or unexpected weather conditions.
- Weather derivatives are based on a specific “weather” trigger (e.g. heating degree days) rather than proof of loss (for instance temperature over a specified threshold and period) and therefore are simpler (and cheaper) to administer than other alternative options.
- Derivatives include forward, futures, and options

Climate Derivatives: 'Climate Option'

- For example, farmers can use weather derivatives to hedge against poor harvests caused by e.g. lack of rain during the growing period or excessive rain during harvesting.
- A farmer who grows peaches in Central Europe relies on the temperature never to fall below a certain temperature (5 °C) during the flowering of frost-sensitive trees. The longer the temperature is below 5 °C, the lower is its harvest.
- This farmer can transfer his business risk to a bank by concluding an appropriate weather derivative with the bank.
- The contract could be designed so that for each day of the months of April and May (the months in which the frost-sensitive peach trees are blooming) at which the temperature measured by the nearest weather station falls below 5 °C, the farmer will be compensated by a specific amount.
- Whether he pays an option premium for this contract, or has a payment obligation to the bank when the temperature is above five degrees Celsius, depends on which specific hedging instrument is chosen.

Thank you