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A Baseline Assessment of Climate Finance

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The Context

The United Nations Framework Convention on Climate Change (UNFCCC) defines 'climate finance' to include local, national or transnational financing for purposes of addressing the impacts of climate change and supporting climate-smart development. These funds may be drawn from the public sector, private sector or hybrids between the two.[1] At the 15th Conference of Parties (COP) to the UNFCCC held in Copenhagen in 2009, a target for climate financing was agreed upon. Developed countries promised to mobilise long-term finance to the tune of US$ 100 billion by 2020, and provide US$ 30 billion between 2010 and 2012 by way of 'fast-start' finance.

While the initial fast-start commitments have been met, largely through Development Assistance budgets of developed countries, there is little clarity on how the long-term requirements will be fulfilled. The Green Climate Fund (GCF), based out of South Korea, is among the only credible institutional arrangements outside of bilateral assistance channels and Multilateral Development Banks (MDBs) that is regarded at as an important source of long-term climate finance. The GCF was set up at COP 16 as an operating entity under the Financial Mechanism of the UNFCCC. The other available institutional fund which is part of the UNFCCC's Financial Mechanism,[2] the Global Environment Facility (GEF), will only have around US$ 4.43 billion available during its sixth replenishment period between July 2014 and June 2018.[3]

There are a variety of ways through which governments are looking to mobilise long-term climate finance, following the recommendations of a High Level Advisory Group formed by UN Secretary-General Ban Ki-moon in 2010. These include administration of general taxes such as a carbon tax; administration of specific taxes, for instance on commodities that have an adverse impact on global climate change; and through ways of leveraging private sector finance, particularly through the capital markets and MDBs.

Private finance is being mobilised through direct investments. However, as per Article 4 of the UNFCCC, developed countries are bound to provide "new and additional financial resources to meet the agreed full costs incurred" by developing countries in order to finance their obligations under Article 12 of the Convention. It is therefore not clear whether private sector investment, in sectors such as infrastructure for instance, qualifies as 'new' or 'additional'.

This issue brief aims to present the following:

(a) an assessment of the gaps and shortages in financing flows;
(b) available monies in the global system; and
(c) suggestions to mobilise resources towards mitigation and adaptation needs of developing countries.

The Climate-Finance Gap

Mitigating and adapting to the adverse effects of climate change will need considerable investment. According to estimates by the United Nations Environment Programme (UNEP), nearly US$ 1 trillion of additional investment will be required annually upto the year 2030 to build 'green infrastructure' and to invest in initiatives to prevent the global average temperature from rising more than two degrees centigrade above pre-industrial levels.[4] This estimate is in addition to the US$ 5 trillion required annually until 2020 to finance investments in sectors such as agriculture, telecommunications and power.[5] Investments will also need to be simultaneously channelled into related social sectors like health and education, as well as towards dealing with the risks of specific adaptation challenges.

According to the International Energy Agency (IEA), barring a "breakthrough at the Paris UN climate conference in 2015", current global policies and market structure will be unable to transition investment into low carbon and energy efficient sources at the requisite scale and speed.[6] The agency estimates that US$ 53 trillion of cumulative energy investments[7] alone will be required upto 2035 to enable the world to adhere to a two-degrees-centigrade emissions path. From this sum, US$ 14 trillion (US$ 550 billion annually) would have to be directed towards energy efficiency alone. However, as highlighted in Table 1, current climate finance flows fall far short of projected requirements.

Table 1: Climate Finance: Estimated Annual Investments Required vs. Actual (US$ Billion)

	Finance Needs				Actual Finance (2012)
Year	**2020**	**2030**	**2035**	**2050**	
Mitigation					
IEA (2014)			550		337
Mckinsey & Co. (2010)		1076		610	
WEF (2010)		700			
IIASA (2012)				400-900	
Adaptation					
Parry et al (2009)		4-100			22
UNFCCC (2007)		49-171			
World Bank (2010)		70-100			

Source: The Global Landscape of Climate Finance, CPI (2013)

Global trends indicate that much of the prevailing climate finance demand-supply gap would have to be met through private sector investments. According to the Climate Policy Initiative (CPI),[8] climate finance flows[9] were estimated to be US$ 359 billion in 2012, out of which private finance[10] accounted for US$ 224 billion (62 percent); public finance accounted for the remaining US$ 135 billion. However, the public sector must simultaneously design robust policy frameworks, allocate risk coverage and ensure transparent price signals in order to close the demand-supply gap and provide leverage for private investment. Moreover, policymakers will have to incorporate economic strategies that facilitate investment through energy policies, transport policies, procurement policies and tax policies, among others.

Potential Fund Availability

Large public sources and delivery mechanisms of funding to meet incumbent climate finance needs include the following: the GCF; carbon pricing (in the form of a carbon tax or a cap and trade scheme); the Clean Development Mechanism (CDM) of the UNFCCC; taxes on specific sectors such as aviation; and renewable energy subsidies.

Table 2: Potential Sources/Delivery Mechanisms for Climate Finance (US$ Billion)

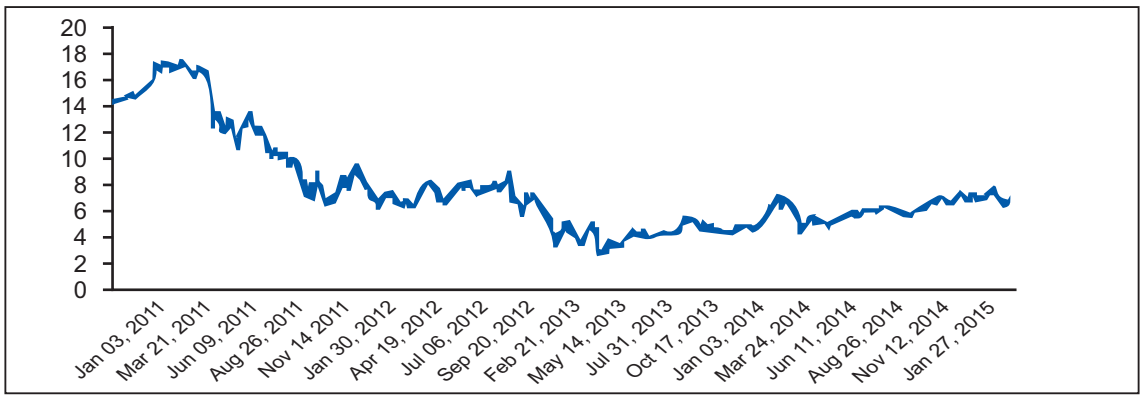
	Estimated Potential	Current Finance Flow
Green Climate Fund (GCF)	100[a]	10
Carbon Pricing	250[b]	30[c]
Clean Development Mechanism (CDM)[d]	-	215.4
Taxes on International Aviation and Shipping Fuels[e]	37	-
Fossil Fuel Subsidies[f]	-	544
Renewable Energy Subsidies[f]	-	120
Assets under Management, Institutional Investors (OECD)	71000	-
Bond Markets	80000	35[g]

[a] annual amount pledged by developed countries till 2020. [b] Revenue raised at $25 per ton of CO2 is estimated at $250 billion in 2020 if implemented for OECD Annex II countries through carbon taxes or a cap-and-trade system with allowance auctions. [c] Current size of the world's emission trading schemes. [d] The total investment in CDM projects registered and undergoing registration as of June 2012 amounts to $215.4 billion. Of that total, the investment in projects that are known to be operating (104) is US$ 92.2 billion. Annual investment peaked in 2008 at $13.9 billion (operating projects) and $40.4 billion (all projects). [e] A globally implemented carbon charge of $25 per ton of CO2 on fuel used could raise around $12 billion from international aviation and around $25 billion from international maritime transport annually in 2020, while reducing CO2 emissions from each industry by 5 percent. [f] According to the IEA, fossil fuel subsidies globally amount to $550 billion – more than 4 times the $120 billion on similar incentives for renewable energy sources. [g] New issuances of green bonds in 2014 totalled $35 billion, up from $11 billion in 2013.

Source: IMF G20 (2012); IEA (2014); UNFCCC (2012); World Bank Treasury; UNEP (2014), Mckinsey & Company (2013).

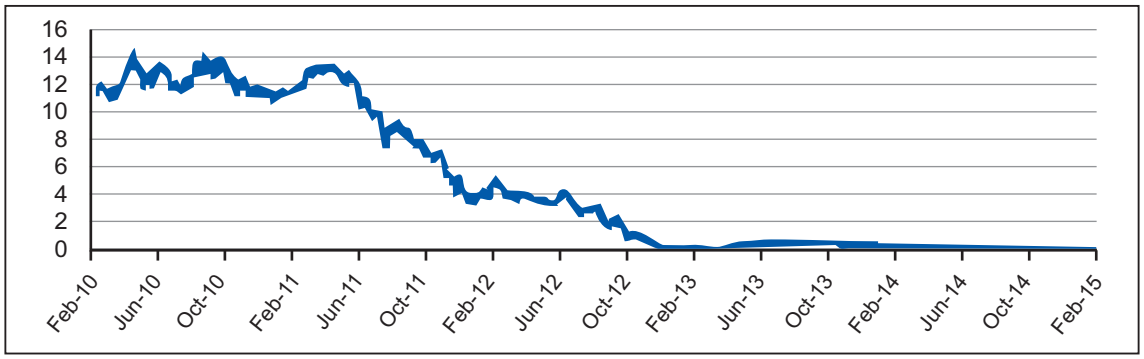
On the pricing front, there has been some measurable progress in the development of carbon markets. For instance, eight new emissions trading schemes[11] in 2013 have taken the current level of financing flows through these mechanisms to US$ 30 billion. However, although the economic rationale for developing carbon markets is well-founded, the price of carbon is on a generally declining trend, varying across geographies. Current carbon taxes range from US$ 1/tCo2 in Mexico to US$ 168/tCo2 in Sweden.[12] Similarly, economic stagnation in the euro zone area has led to the collapse of the EU's Emissions Trading Scheme (EU ETS), with prices declining to a US$ 5-9 range from US$ 18 in 2011 (See Graph 1).

Graph 1: EU Allowance (EUA) Auction Prices, €/tCO2 (Source: European Energy Exchange)



The falling carbon price has also led to a fall in prices for the UNFCCC's Certified Emissions Reductions (CERs) that are issued under the CDM towards CDM projects (See Graph 2). CERs are trading at near-zero, at around US$ 0.02, from a peak of US$ 20 in 2008. Indeed, CDM has stagnated – with annual investment peaking in the same year.[13] While different regional, national, and sub-national market mechanisms have led to multiple price regimes, inter-temporal fluctuation of carbon prices will continue to stifle such market-linked investments. Therefore, while Table 2 suggests that the scope for uniform carbon price of US$ 25 per ton of carbon dioxide can raise US$ 250 billion by 2020, this is unlikely to be achieved.[14]

Graph 2: CER Emissions Index, €/tCO2 (Source: Intercontinental Exchange)



While the cost-competitiveness of renewable energy has increased due to evolving technology, the sector still largely relies on an extant subsidy mechanism in many regions. This support ranges from direct budgetary allocations to 'off-budget' support in the form of price controls.[15] A classic example is Germany's Renewable Energy Act (2000) that stipulates, among other provisions, preferential access to the electricity grid as well as a premium over market rate of tariffs to renewable energy producers. The implicit subsidy is eventually passed on to the end-user–an average household in Germany paid an additional US$ 355 to subsidise renewable electricity.[16] However, developing countries may not necessarily have either the financial bandwidth or the requisite grid capacities to replicate such success premised on government subsidies. Even if fossil fuel subsidies are redirected as per the suggestions of the High Level Advisory Group, the higher costs of renewable energy integrated with the grid cannot be offset, and therefore will have to be passed on to the end user.[17] The scope for this is very limited given the already steep power tariffs of the industrial sector in a developing country like India (See Table 3)

And finally, specific taxes on international aviation and shipping as well as a financial transactions tax (FTT) are impeded by competitiveness concerns. For instance, the FTT (also known as a "Robin Hood tax")–championed by a subset of Eurozone countries–has faced considerable opposition owing to concerns about adverse effects on bank credit and economic growth.[18] Ultimately, the efficacy of specific taxes like FTT will likely depend on broader support and even then, be far lower than that of a universal carbon tax both due to a narrower tax base as well as potential sectoral distortions.[19]

Table 3: Electricity Prices for Industry (USD per MWh)

Country	USD/MWh
India	332.81*
US	68.196
UK	139.779
Germany	169.322
OECD	118.603**

*USD at PPP using a conversion factor of 0.3 that makes 1 USD = Rs. 18.81 (Using an exchange rate of 1 USD = Rs. 62.69) **2012 data

Source: IEA Statistics (2014); GoI, Annual Report on the Working of State Power Utilities & Electricity Departments (February 2014).

Suggestions for Resource Mobilisation

In light of the above, attention must be focussed on other institutional sources of finance, including large institutional investors which account for a majority share of investments in the global economy. In addition, development finance institutions such as MDBs accounted for about one-third of climate finance in 2012. They can also mobilise private finance by extending grants and concessional loans, providing early-stage equity infusions and designing innovative instruments (Green Bonds, climate investment funds and others) in order to address risk gaps in green infrastructure projects. There are already several such instruments in existence such as credit lines extended by MDBs. According to the World Bank, public finance like non-concessional lending can leverage private finance up to three to six times and concessional lending up to eight to ten times.[20] However, there continues to be significant shortfall between demand and supply. While there are a number of long-term investment funds like the Government Pension Fund of Norway (US$ 860 billion) and California's public pensions fund CALPERS (US$ 296 billion) that have adopted proactive policies towards sustainability linked financing—which for all practical purposes is equivalent to climate finance—few are invested in developing countries where the recorded deficits are the largest. Institutional investors, including pension funds, insurance companies and Sovereign Wealth Funds, represent significant potential in this regard (Table 4).

Table 4: Asset Allocation of Institutional Investors

Type of Investors/ Asset Allocation	Assets Under Management (USD Trillion)	Current Investment in Infrastructure	Current Investment in Emerging Economies
OECD Institutional Investors	80	1%	Up to 10%
Emerging Market	5	<1%	70-80%
Sovereign Wealth Funds	4	2%	30-50%
Other global institutional investors	20	1%	Up to 10%

Source: Georg Inderst and Fiona Stewart, "Institutional Investment in Infrastructure in Emerging Markets and Developing Economies," Public-Private Infrastructure Advisory Facility (March 2014): 32.

In addition to the large potential of re-prioritised institutional investments, there are three prominent factors in the current global policy and market environment that make for a favourable context. First is the decline in oil prices: which means that there should be a greater appetite for financing as fiscal room to manoeuver increases in large oil importing countries in particular. This should especially be the case in countries such as India where fossil fuel subsidies account for close to two percent of GDP.[21] Second, financial institutions and banks are looking at ways to scale up sustainability-linked financing. For instance, institutions such as the Small Industries Development Bank of India (SIDBI) are helping in capacity building of SMEs and effectively work towards their resource transformation. SIDBI is also creating a market for energy efficiency that will work with the SMEs. Third, given that the capacity to think about sustainability-linked financing is limited, a number of stakeholders have begun to recognise the capacity of finance professionals to sieve investments through a sustainability lens. This is exhibited by the proliferation of sustainability-linked signalling instruments in the financial markets such as the Dow Jones Sustainability Indices, the FTSE4Good Indices and the S&P BSE GREENEX index that benchmark sustainability-linked corporate performance in Indian markets.

Hundreds of billions of dollars by way of institutional climate finance would be required to finance the deficit of investments in climate change mitigation and adaptation-linked infrastructure. While infrastructure demands the largest sums of investment, it also represents the low hanging fruit since it represents a measurable input intrinsically linked to development. In the global context this points towards the importance of developing a coherent long-term strategy to incentivise a more robust sustainability-oriented market framework and institutional participation. The following suggestions could serve as a starting point for doing so:[22]

- The banking sector plays a critical role in financing infrastructure growth–total assets for banks globally amount to over US$ 139 trillion. Indeed, nearly all institutional lending towards the sector is through banks in countries with nascent capital markets such as India. According to the McKinsey Global Institute, BRICS countries alone require an average infrastructure investment totalling 5.5 percent of their respective GDPs, while the figure for the United States and Japan stands at 3.6 percent and 2.6 percent, respectively.

  However, these figures are likely to be on the conservative end: India has an estimated infrastructure investment requirement of roughly 10 percent of its GDP (US$ 1 trillion) for the period 2012-17. This represents a large challenge as well as a commensurate opportunity.

  The pattern of infrastructure growth can be made more sustainable through the integration of best practices in urban planning, transportation and energy efficiency (which is highly significant, given that urban emissions are responsible for nearly half of global emissions). This in turn requires a reworking of the terms of bank lending towards infrastructure projects, for instance making certain efficiency benchmarks mandatory and using effective commercial frameworks to make infrastructure investments viable.

- Mechanisms to address commercial gaps such as partial risk guarantees, lines of credit or early-stage investment through public budgets can attract greater flows of private finance into Greenfield projects that are typically perceived as 'high risk' projects in developing countries in particular. Partial credit guarantees can enhance credit rating of an A-rated bond to AA (a cost reduction of 1.9 percent) while partial risk guarantees can attract foreign funds by mitigating political risk (cost reduction of 1.8 percent).[23] In September 2012, the Asian Development Bank (ADB) launched a US$ 128 million facility as a partial credit guarantee on rupee denominated bonds issued by Indian infrastructure companies.[24] Similar mechanisms can be implemented, especially in countries with shallow bond markets.

- There are a number of factors that are extraneous to the financial system including accuracy and predictability of certain data–like resource data and performance data of various projects. The existing commercial and technological ecosystem has made lenders risk averse, in an economy where rapid credit expansion is required for growth. Since the aforementioned unpredictability compounds 'risks' of the financial ecosystem, there must be renewed emphasis placed on building requisite skill sets to evaluate data through sustainability-linked risk metrics as well as improving project management capacities.

  Frameworks such as Strategic Sustainable Investing (SSI) and Sustainable and Responsible Investing (SRI) rely on environmental, social and corporate governance (ESG) analyses in order to generate long-term sustainable returns. According to the US SIF, one-sixth of assets under management (~$6.5 trillion) in the Unites States were invested using the SRI strategy.[25] Such analyses and investment frameworks can be replicated at scale in other parts of the world as well.

- Finance needs to take the concept of 'sustainability' as a parameter and there will be challenges in doing so at the project implementation level. For this, a slew of innovation is required in the financial ecosystem, particularly in the public sector institutions that account for over 60 percent (US$ 500-550 billion) of the total infrastructure financing in developing economies.[26] For instance, a consortium of banks recently released the Green Bon Principles[27]–set of voluntary guidelines in order to a set common standards and ensure transparency towards building a robust and liquid market.

- There is also a large latent opportunity in infrastructure financing through the global bond markets which account for nearly US$ 100 trillion in assets. In fact, Green Bond issuances in 2014 totalled just US$ 36.6 billion.[28] Most recently, the International Finance Corporation (IFC) is expected to issue its first ever green bond worth US$ 50 million to finance climate-related projects by India's Yes Bank.[29] Greater involvement of supranational bodies can go a long way in deepening bond markets in emerging economies and addressing credit and liquidity related risks.

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Endnotes:

1. http://unfccc.int/focus/climate_finance/items/7001.php
2. Also serves as Financial Mechanism under: Convention on Biological Diversity (CBD), UN Convention to Combat Desertification (UNCCD), Stockholm Convention on Persistent Organic Pollutants (POPs), Minamata Convention on Mercury.
3. http://unfccc.int/resource/docs/2014/cop20/eng/05.pdf#page=23
4. Aligning the financial system with sustainable development, UNEP (2014)
5. Green Investment Report, WEF (2013)
6. World Energy Investment Outlook, IEA (2014)
7. Cumulative investment in energy supply ($39 trillion) and energy efficiency ($14 trillion)
8. The Global Landscape of Climate Finance, CPI (2013).
9. The report uses 'climate finance' to refer to capital flows targeting low-carbon and climate-resilient development with direct or indirect greenhouse gas mitigation or adaptation objectives/ outcomes.
10. Due to data limitations, the figure for private finance excludes investment targeting energy efficiency and adaptation investment.
11. California Cap-and-Trade Program; Québec Cap-and-Trade System; Kazakhstan Emissions Trading Scheme; and five Chinese pilot emissions trading schemes (Shenzhen, Shanghai, Beijing, Guangdong, and Tianjin).
12. State and Trends of Carbon Pricing, World Bank (2014).
13. Benefits of the Clean Development Mechanism, UNFCCC (2012).
14. *Mobilizing Climate Finance*, A paper prepared at the request of G20 Finance Ministers (2012).
15. It is worth noting that some of the developed country subsidies are also geared towards developing new technologies for export markets.
16. "Sunny, windy, costly and dirty", *The Economist*, January 18, 2014, accessed March 9, 2015, http://www.economist.com/news/europe/21594336-germanys-new-super-minister-energy-and-economy-has-his-work-cut-out-sunny-windy-costly.
17. According to the IEA, global fossil fuel subsidies account for around USD 500 billion.
18. Ralph Atkins, "Robin Hood tax: A long shot", *Financial Times*, May 20, 2013, accessed March 9, 2015, http://www.ft.com/intl/cms/s/0/b8cdc3e6-bef9-11e2-87ff-00144feab7de.html?siteedition=intl#axzz3TrlHVwsi.
19. Dipak Dasgupta, Rajasree Ray and Nikhila Menon, "International Taxes to Finance International "Green" Climate Fund (GCF) – Application to Aviation Taxes", Ministry of Finance, Government of India (August 2011).
20. State and Trends of Carbon Pricing, World Bank (2014).
21. Government of India, Union Budget Documents 2015-16.
22. Some suggestions here borrow from "Designing a Sustainable Financial System for India", a 2015 interim report by UNEP and the Federation of Indian Chambers for Commerce and Industry, to which experts from the Observer Research Foundation have contributed substantial time and intellectual inputs.
23. Gireesh Shrimali, Charith Konda and Sandhya Srinivasan, "Solving India's Renewable Energy Financing Challenge: Instruments to Provide Low-cost, Long-term debt", A CPI-ISB Series (March 2014).
24. K.R. Srivats, "ADB launches $128-m facility to provide partial guarantee on Indian infra bonds", The Hindu, September 21, 2012, accessed March 9, 2015, http://www.thehindubusinessline.com/economy/adb-launches-128m-facility-to-provide-partial-guarantee-on-indian-infra-bonds/article3922153.ece.
25. US SIF – The forum for Sustainable and Responsible Investing, "SRI Basics", accessed March 2, 2015, http://www.ussif.org/sribasics.
26. Amar Bhattacharya, Mattia Romania and Nicholas Stern, "Infrastructure for development: Meeting the challenge," CCCEP, LSE, G24 (2012).
27. "The Green Bond Principles", International Capital Markets Association (ICMA), accessed March 9, 2015, http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/.
28. Climate Bonds Initiative
29. "IFC to invest $ 50 m in YES Bank's Green Bonds", The Hindu Business Line, March 2, 2015, accessed March 9, 2015, http://www.thehindubusinessline.com/industry-and-economy/banking/ifc-to-invest-50-m-in-yes-banks-green-bonds/article6952159.ece.

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