Climate Investment Funds

CTF/TFC.17/4
June 3, 2016

Meeting of the CTF Trust Fund Committee
Oaxaca, Mexico
Thursday, June 16, 2016

Agenda 4

CTF FUTURE STRATEGIC DIRECTION

PROPOSED DECISION

In the context of the discussion on Strategic Directions of the CIF held during the joint meeting of the CTF and the SCF Trust Fund Committees, the CTF Trust Fund Committee discussed the document CTF/TFC.17/4, *"CTF Future Strategic Direction".*

The Committee, having discussed the results achieved, notes the lessons learned and elements for the strategic future direction of the CTF, and agrees that the following key elements could guide the operations of the CTF in future if appropriate:

a. Adopting an enhanced programmatic approach;
b. Engaging in priority investment areas and new frontiers; and
c. Exploring new financing modalities.

Without pre-empting any decision on whether to pursue future operations, the Committee also requests the CIF Administrative Unit, in consultation with the MDBs and Trustee to

a. explore and propose any modifications required in current in the CTF documents to implement the proposed programmatic approach; and
b. develop concrete proposals on priority investment areas and new frontiers that could be implemented within 18-24 months

for consideration by the Committee at its December 2016 meeting.

The Committee notes the work undertaken and analysis conducted by the CIF Administrative Unit, in consultation with the MDBs and Trustee on the new financing modalities in the context of leveraging the reflows and mobilizing additional capital from public and private sources. The Committee also notes the issues identified in the document that require further analysis.

The Committee requests the CIF Administrative Unit, in collaboration with the MDBs and the Trustee, to conduct any necessary due diligence and to fully develop proposals for new financing modalities. The CIF Administrative Unit will regularly consult and update the Committee on the progress of such work to allow members sufficient time for internal consultations.

The Committee also requests the CIF Administrative Unit and the Trustee to conduct any necessary consultations with the contributors on making available the reflows (and any other available assets in the CTF trust fund) for use in accordance with a decision by the Committee and to agree with the contributors on the required arrangements as soon as feasible. The Committee will make such decision on the use of reflows at its next meeting in December 2016.

In conjunction with the development of the new financing modalities and the consultations with contributors, the Committee further requests the CIF Administrative Unit, MDBs and the Trustee to explore any necessary modifications in current legal agreements and CTF documents and initiate any other necessary consultations with relevant parties.

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1 Introduction

1. The Clean Technology Fund (CTF) Trust Fund Committee, at its meeting in November 2015, noted the work done and analysis conducted by the CIF Administrative Unit and the MDBs to explore how best to build on the CTF's financial and operational strength, experience, and unique "MDB-collective" business model to increase the scale and broaden the range of the capital engaged.

2. The CTF Trust Fund Committee requested the CIF Administrative Unit, in collaboration with the MDBs and the Trustee, to further explore detailed modalities, including legal and institutional changes required, to strengthen the current business model of the CTF by mobilizing additional capital from public and private sources and deploy its resources efficiently and effectively for enhanced mitigation actions in developing countries.

3. The paper seeks to build on the lessons learnt from CTF 1.0 such as the scalability potential of a programmatic approach, strengths of the MDB-collective models, flexibility of use and deployment of targeted instruments made available to facilitate private sector financing in the development of key clean technologies.

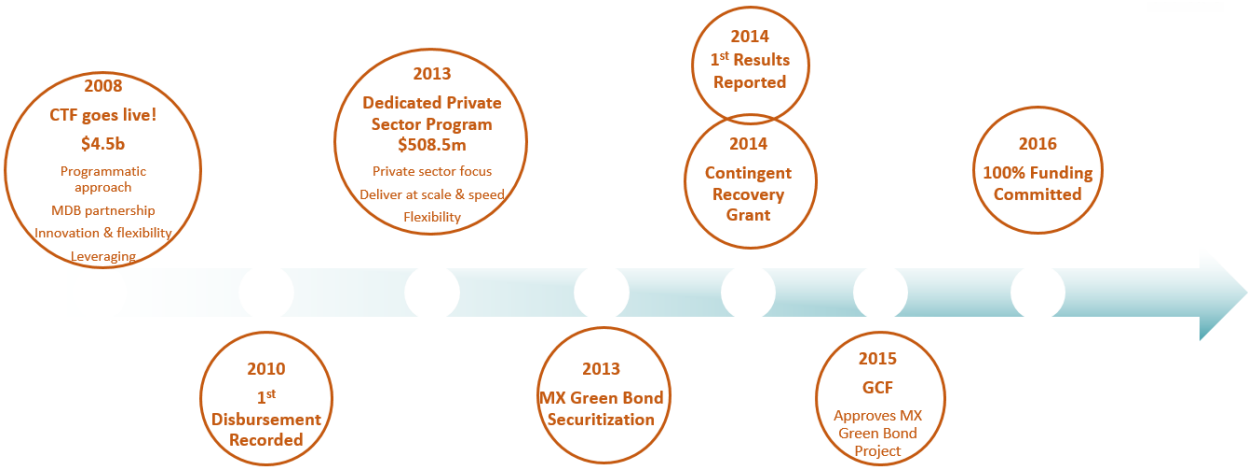
4. The proposed CTF 2.0 presents a unique opportunity to ensure most efficient use of limited public resources through the use of reflows from legacy assets in order to mobilize private sector financing and in the process, minimize the need for periodic replenishments from contributor countries. The key objective of CTF 2.0 would be to use an enhanced programmatic approach to support high impact technologies, traditional and new, to help meet commitments made under the Paris agreement.

2 Context

5. The CTF was established in 2008 to provide scaled-up financing to contribute to the demonstration, deployment, and transfer of low-carbon technologies with a significant potential for long-term greenhouse gas emission savings. The CTF was designed to ramp up the deployment of clean technologies within the energy, industry, transport, and building sectors, which together account for over 75 percent of global emissions.[1] In particular, the CTF was seen as a response to the need for upfront capital at concessional terms for clean energy investments not met through the flow of results-based payments via the Clean Development Mechanism. There was also an urgency to unlock private investments, especially for mitigation activities with clear revenue streams.

[1] Intergovernmental Panel on Climate Change 2014. "Fifth Assessment Report (AR5) Synthesis Report."

Figure 1: CTF Timeline



6. Over the years (see Figure 1), the CTF has grown from an initial USD 4.5 billion in pledges supporting 12 country investment plans and one regional program to USD 5.6 billion in support of 15 country investment plans, one regional program for concentrated solar power (CSP) in the Middle East and North Africa (MENA), and the Dedicated Private Sector Programs (DPSP). By design, the CTF has differed from other mitigation-focused, multilateral climate instruments by focusing on larger transactions in a smaller number of countries. The CTF aims to drive down technology costs, stimulate private sector participation, and catalyze transformative change that can be replicated elsewhere. The average CTF investment size is five times greater than that of other mitigation-focused financing instruments.[2]

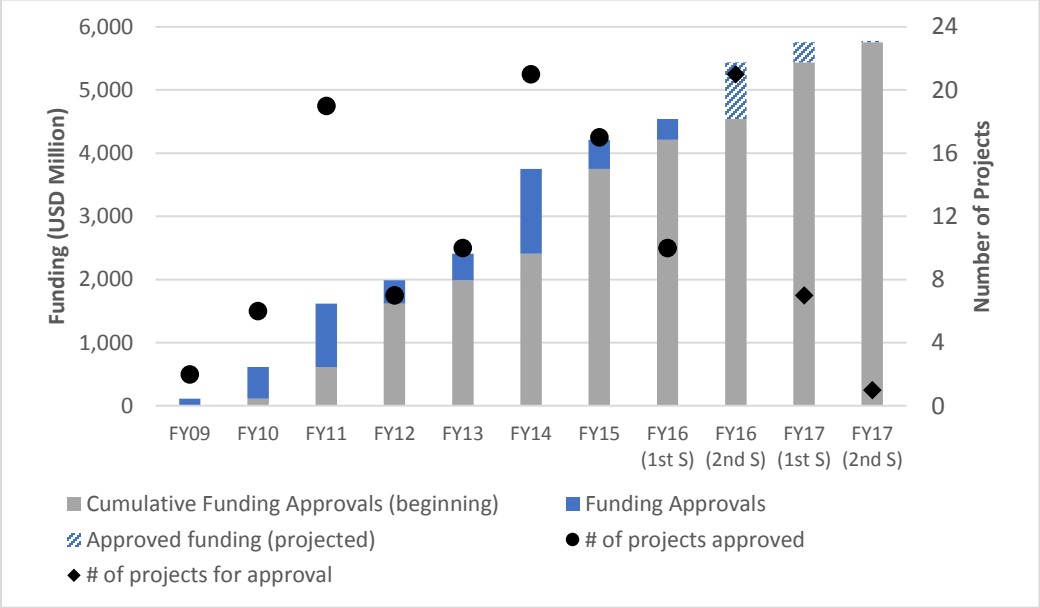
7. The private sector is a key player in the CTF with nearly one-third of total CTF resources, or more than USD 1.9 billion, going to private sector projects and programs and approximately one-third of total co-financing mobilized from the private sector. In 2013, the CIF embarked on new financing paths that put greater emphasis on reducing barriers to private sector participation. The Dedicated Private Sector Programs (DPSP) under the CTF were created to finance operations that can deliver scale and speed while maintaining country priorities. The DPSP are currently in their second phase and have allocated a total of USD 508.5 million to eight programs reaching countries as diverse as Chile, Colombia, Indonesia, Mexico, Turkey, Haiti, Honduras, and four countries in the MENA region – Jordan, Egypt, Tunisia, and Morocco.

8. As of December 31, 2015, more than USD 4.5 billion have been approved by the CTF Trust Fund Committee for 92 projects and programs. The remaining CTF resources are expected to be approved by October 2016. Delivery has picked up significantly during the last two years, in terms of funding approvals, disbursements, and actual results measured against CTF core indicators, including GHG emissions reduction, co-financing, installed renewable energy capacity, and energy savings.

[2] CIF 2014. *Learning by Doing: The CIF's Contribution to Climate Finance.*

9. Figure 2 highlights the strong track record of CTF built over the years even as a number of the approved projects have been first-of-its-kind in the country/region. It is expected that by the end of calendar year 2016, CTF will have committed all of its funding to current projects in the pipeline. These projects are expected to result in over 1 billion tons of CO2 reduction though 22 GW in renewable energy capacity installed, 70 GWh of energy saved, and mobilize around USD 45 billion in additional resources, once implemented.

Figure 2: Funding Approvals (by TFC, by FY)



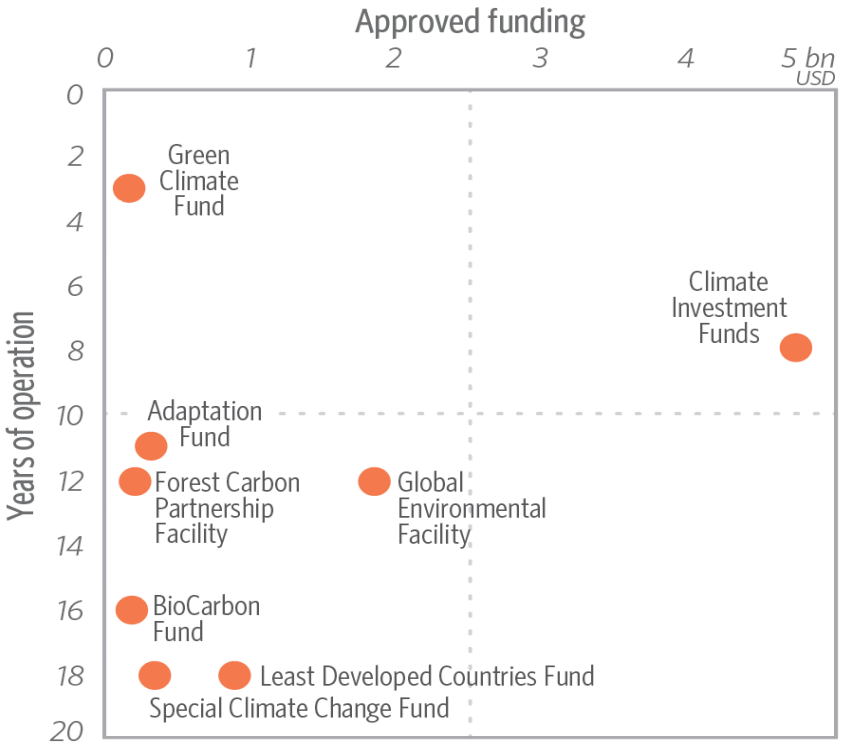
10. As reported in the 2015 Results Report,[3] CTF projects have resulted in greenhouse gas emission reductions of 5.5 million tCO_2e per year, 4 GWh in energy savings annually, installation of close to 3 GW in renewable capacity, and the mobilization of over USD 11 billion in co-financing so far. Overall, the CTF has been delivering what it was set to achieve, working closely with the MDBs, partner countries, and other stakeholders. With a proven track record to deliver investments and results on the ground, and the capacity to adapt in response to the evidence of gaps, the CTF is well positioned to ramp up deployment of low-carbon technologies with a significant potential for long-term greenhouse emissions savings.

[3] *CTF 2015 Results Report.*

Key features of the CTF business model

11. **Providing resources at scale** has proved to be critical to mobilize countries and MDBs to initiate and achieve transformation (see figure 3). When their country investment plans were endorsed, CTF countries typically received a resource allocation of USD 200-500 million per country. DPSP funding, totaling USD 509 million, was also significant for MDBs to program a number of thematic/technology-focused programs, including geothermal.

Figure 3: CIF Experience vis-a-vis other funds



12. A strong example of CTF's ability to invest at scale is global CSP development. USD 750 million was allocated to the MENA-CSP program, with most of that funding eventually approved for CSP projects in Morocco. In total, CTF funding for CSP worldwide amounts to USD 900 million, and expect to leverage an additional USD 6 billion in co-financing from the MDBs, governments, private sector, and other sources. CIF and associated investments are expected to lead to 1 GW of new CSP installed capacity, which is about a quarter of the current total CSP capacity worldwide. Concessional resources from the CTF have already contributed to cost reduction of CSP. For example, in Morocco, CTF led to a reduction of 25 percent in costs for Noor I and an additional 10 percent for Noor II and III, and in the process, helped reduce the government subsidy required to bridge the affordability gap for CSP.

13. By placing an **emphasis on private sector engagement and backing that up with significant funds**, the CTF has demonstrated that mobilizing private sector investments for mitigation

projects can be done and can prove transformative. For example, in Thailand, a CTF concessional loan of USD 4 million blended with IFC's own resources provided crucial early stage support to one of the country's first solar power developers to bring 12 MW of solar photovoltaic capacity over the finish line. Six years later, the Solar Power Generation Company (SPGC) has raised more than USD 800 million, installed more than 260 MW solar PV, and is aiming for 500 MW by 2020.

14. The ability to bring to the market a suite of **financial instruments that can be tailored** to project needs and specific project barriers **and bear significant risk** (such as local currency lending, mezzanine products, first loss structures, among others) has been key to mobilizing a significant level of private sector investment. Although the CTF portfolio has been dominated by loans, the type of financial instruments employed by the MDBs has become more diversified over time and the use of higher risk financing instruments more prevalent as important policy changes were introduced based on past experience.

15. The MDB partnership is demonstrating the **flexibility of the CIF programmatic approach** by supporting countries and each other in developing CTF investment plans and the DPSP. This collaboration has improved coordination with key stakeholders at the country level, generated synergies through complementary actions, and facilitated large-scale financing in key technology areas.

3 Value proposition: CTF 2.0

16. The proposal recognizes the limited availability of public resources due to competing priorities of contributor countries as well as the urgency in supporting mitigation investments in CTF countries and as such, is based on making the most efficient use of such resources to leverage additional sources of private sector financing in order to meet the proposed CTF 2.0, strategic priorities. It involves the use of reflows from legacy assets of CTF 1.0 to support implementation of one or more modalities, and in the process, presents a rare opportunity to demonstrate the use, or rather re-use, of limited public sources of financing to deliver on a key public good.

17. Over the years, CTF has developed a substantial asset base attributed to its portfolio of committed loans to various middle income countries. By the end of FY17, this asset base will increase to USD 5.6 billion, reflows from which are already being realized. Using this anticipated debt service to support capital market borrowing - in effect, increasing somewhat the extent of leverage in CTF's capital structure[4] - would enable CTF to sustain a prudent cash reserve while continuing to make additional commitments to finance the projects advancing the objective for which CTF was created. Based on preliminary analysis and financial modeling, up to USD 4.25 billion in additional funding could initially be mobilized under CTF 2.0 using these reflows. This may or may not require additional commitments from contributors depending on their risk appetite and the underlying objective of the preferred modality.

18. Based on CTF's track record and lessons learned since its inception as well as new challenges and opportunities faced by the international community in a SDGs and post-Paris Agreement world the key elements of the proposed CTF 2.0 entail:

[4] CTF already employs leverage in its finances, in the form of "loan contributions" from several of its contributors.

a. Adopting an enhanced programmatic approach;
b. Engaging in priority investment areas and new frontiers; and
c. Exploring new financing modalities.

3.1 Enhanced programmatic approach

19. The CTF has employed a programmatic approach as its primary model of delivery. The CTF programmatic approach has several notable features, such as:

    a. MDB coordination and collaboration at the planning and project levels, and inter-ministerial coordination and policy dialogue at the highest levels to enhance national impacts of climate investment;
    b. Predictability of resource availability;
    c. Linking of public and private sector investments;
    d. Programmatic results measurement; and
    e. Efforts to enhance knowledge and learning, as well as gender and social inclusion across countries' programs.

20. In 2013, in order to enhance private sector engagement through CTF investments a Dedicated Private Sector Program (DPSP) was launched. The DPSP is underpinned by a thematic programmatic approach with strong links to country priorities and CTF program objectives under which MDBs collaboratively identified pipeline opportunities that could deliver scalable investments within a reasonably short period of time.

21. Drawing on the lessons learnt from both, country-led investment plans that focus on strategic areas prioritized by host countries, as well as thematic and technology-based programs across countries and regions, as exemplified by the existing DPSP model, it is proposed that CTF 2.0 adopts an enhanced programmatic approach under which both geography focused as well as thematic (i.e. technology, sector, instrument based) focused programs would be considered for support. Such an approach can harness the benefits and scale of the MDB partnership in support of priority investment areas including new frontier areas, while providing agility and a predictable and strategic framework within which to develop and structure investments.

3.2 Investment Priorities

22. Over the next 15 years, the global economy needs around USD 5-6 trillion annually to be invested in infrastructure assets, of which, around USD 2 trillion can be marked to developed countries while the rest to low and middle income countries[5]. These investment needs spread across energy and transport systems, cities, water and sanitation and telecommunication, sectors also identified by

[5] Bhattacharya, Amar, Jeremy Oppenheim, and Nicholas Stern, "Driving Sustainable Development through Better Infrastructure: Key Elements of a Transformation Program," *The Brookings Institution Global Economy and Development Working Paper* 91, July 2015

MDBs as priority areas requiring additional support including concessional finance to meet their goal of scaling up climate financing in order to advance low-carbon, climate-resilient transition.

23. An analysis of MDB climate change strategies and action plans[6] indicates that the MDBs are focusing their efforts on the few key sectors that best reflect the diverse and specific needs of the countries in which they operate. Over the period to 2020, MDBs' climate change strategies and action plans are aligned with global priorities identified in in Intended Nationally Determined Contributions (INDCs): renewable energy (mentioned in 76 percent of INDCs), water (75 percent), energy efficiency (71 percent), agriculture (69 percent) and transport (64 percent).[7] Table 1 presents these priority sectors for each MDB, the INDCs, and estimated annual investment gaps for each sector. Importantly, MDBs will be expanding climate action into sectors or technologies they have not targeted in the past, or at the scale required.

Table 1: MDBs' priority areas of action to 2020; Priority sectors indicated in submitted INDCs; Estimated annual investment gaps per sector to 2020 or beyond (in USD billion per year).[8]

	Energy Systems		Cities		Climate-smart Land use	
	EE	RE	Sustainable Transport	Urban Dev't	LULUCF	Water
MDBs	√	√	√	√	√	√
INDCs	√	√	√	√	√	√
Additional investment required *(USD bn/p.a.)*	**350-500**	**540**	**730**	**400-1,100**	**>150-250**	**260-800**
- ***Developing***	*>200*	*295*	*50-470*	*n/a*	*n/a*	*>260*
- ***Developed***	*>100*	*245*	*n/a*	*n/a*	*n/a*	*n/a*

Source: Climate Policy Initiative

Key: Energy efficiency (EE); Renewable energy (RE); Land use, land use change and forestry (LULUC). Note: the investment estimates per sectors reported above rely on different methodological approaches and, hence cannot be aggregated due to the risk of double counting.

24. Even though progress continues to me made in reducing costs and widening deployment of clean technologies, there continue to be significant barriers largely related to underlying risks, availability of predictable, affordable, long-term financing, associated business models to sustain them and

[6] Climate change strategies and/or action plans have been endorsed by the Boards of EBRD, IDB, and the World Bank Group.
[7] UNFCCC analysis of 119 NDCs (representing 147 Parties, both developed and developing countries) submitted as of October 2015 (UNFCCC, 2015a). The sector priorities also align with those of the 70 CIF recipient countries submitting INDCs.
[8] Sources: interviews with MDBs stakeholders; WBG (2016); Joint-MDBs (2016); ADB (2008), AfDB (2012), EBRD (2015a), and IDB (2015). The focus areas of INDCs are based on UNFCCC (2015a) and UNFCCC (2016). Investment needs estimates based on: SE4ALL (2014) and IEA (2015) for energy efficiency; IRENA (2016) and SE4ALL (2014) for renewable energy developing/developed split; Bielenberg et al. (2016) and UNCTAD (2014) for transport. CCFLA (2015) for urban; Delgado et al. (2015) for LULUCF (forestry); UNCTAD (2014) and Bielenberg et al. (2016) for water (including sanitation).

existing information gaps that impede their deployment at scale. Closing the investment gap across these sectors will be challenging for a number of reasons, mainly:

a) The majority of the need is in low to middle-income countries, each with their own unique barriers and challenges to address
b) Large volumes of investment need to occur in sectors/technologies that are new to some regions or have been historically difficult to scale up[9]
c) Investment needs to occur at a scale and speed that is an order of magnitude higher and faster than historic infrastructure investments[10]

25. While there is a continued role for CTF to support the types of investments prevalent in its current portfolio in certain persistent high-risk markets, CTF 2.0 should push the boundaries of its engagement to emerging sectors that have potential to deliver high impact. Frontier areas for CTF support could include, but are not limited to, the following themes:

I. Energy storage. Energy storage is emerging as a viable solution to manage the intermittent and distributed nature of renewable energy and improve grid efficiency. The focus on storage is relevant for a number of reasons. First, increased penetration of intermittent renewable energy sources causes imbalances in the grid that must be managed by increasingly expensive peaker plants. Second, aging transmission and distribution networks create bottlenecks that prevent cost-effective sources of energy from reaching the areas where it is needed most; moreover, the costs of laying down new lines are extremely high. Third, excess energy produced that cannot be absorbed by the grid is wasted, while at the same time there are reliability issues related to the existing sources of supply. These challenges can be addressed by pairing renewable energy sources with energy storage.

Energy storage is at the threshold of becoming economically viable, similar to the PV industry status 7-8 years ago. It is emerging from niche applications (such as mini-grids) to economic viability in mainstream settings (such as frequency regulation) mainly due to falling cost of components, growing demand to manage the intermittent and distributed nature of renewables, and to improve grid efficiency. Despite the demand, there are barriers to widespread deployment including: a) *cost of technology and payback time*; b) *lack of regulatory clarity*; c) *uncertain revenue streams*; and, d) *access to commercial finance*. Concessional sources of financing can facilitate the penetration and scaling-up through interventions that help bridge the gap to commercial project viability, mitigate real and perceived business risks, finance first-of-its-kind projects and support technical assistance (TA) work to promote regulatory framework convergence, establish testing and certification standards to ensure quality and reliability, etc.

[9] E.g. energy efficiency, transport or land-use management, including forestry.
[10] The value of infrastructure required in cities in the next 15 years could be higher than the total value of city infrastructure today (CCFLA, 2015).

II. **Energy efficiency in the buildings sector.** Cities consume around 66 percent of the world's energy and account for 70 percent of GHG emissions, with buildings accounting for about one-third of global energy use and related GHG emissions. If the right investment choices are not made today, we will be locking in high-cost, high-carbon urban infrastructure for the next 40-70 years. With short payback periods between two to eight years, every additional dollar invested in energy efficiency measures can potentially generate three dollars in future fuel savings by 2050. However, barriers still remain, such as: a) *higher costs*, up to 12% higher than traditional buildings; b) *lack of a market entity to absorb these costs*, as immediate affordability outweighs future energy and water savings; c) *lack of a system to validate savings* that hinders flow of capital to the sector; d) *lack of information* in the market, among others.

While many admit that green buildings may present a financially sound proposition, no party is willing to take the risk of higher upfront cost combined with unknown pattern of returns. This is where concessional finance can be critical, either absorbing incremental cost, associated with "greening" a building or providing performance assurances. The latter can be achieved by either setting up financial structures that can protect the overall investment returns or by establishing a standardized certification process that would guarantee certain minimal level of performance. With more experience and market penetration, the benefits of green buildings will become thoroughly understood, the market demand will pick up, and fully commercial financing will follow.

III. **Sustainable transport.** Transport accounts for 23 percent of global (non-agricultural) CO_2 emissions and business-as-usual (BAU) projections suggest that by 2030, transport emissions will rise by roughly 70 percent, mostly from emerging economies. Not only is it possible to change the trajectory for transport emissions, but doing so would generate significant co-benefits such as reduced congestion, pollution and accidents, improved health, quality of life, enhanced productivity and economic growth. In many cases, switching to a lower carbon transport system requires a transformation that is complex and capital intensive. Though investments generate economic co-benefits, revenue generating ability is often limited by affordability concerns; even operational cost recovery is often a challenge, making it difficult to attract private sector funds at scale.

Technical assistance and policy support is needed to put in place stable regulatory and tax policies, to integrate transport and urban development policies, and to integrate low carbon and climate-resilient projects into planning decisions. Counterparty risk guarantees for transport concession agreements, credit enhancement, , innovative land-use and building fee or tax mechanisms, and transport bonds could also be used as potential instruments to facilitate access to long-term debt, and concessional finance has a role to play to pilot and scale them up. The MDB-collective model is an optimal vehicle for delivering the desired results. First, because MDBs are critical to managing the governance and risks that are common to complex, sub-national transport investments that involve environmental, social, and inter-governmental, and public-private issues. Second, because MDBs bring trusted long-

term relationships that allow them to work effectively with sub-national, municipal, national, and private sector actors. And finally because a programmatic (vs a project-by-project) approach is required for the types of 'transformative' investments that will be required—whether with sub-national interventions or for private sector-led initiatives.

IV. **Global distributed energy capacity additions.** Two primary forces will drive the growth of distributed generation in coming years: rising peak energy demands through localized energy solutions (peak shaving), and access to the 1.1 billion people who still lack basic energy services. Distributed generation assets are modular and adaptable to a variety of applications and hence are best suited to address both these needs.

Despite the significant demand and relevance of these investments they offer insufficient risk-reward to private sector investors and to lenders for the following reasons: a) r*egulatory risks*, given a lack of specific policies for such project due to lack of experience; b) *higher cost*, when compared to the alternative fossil fuel choices; c) *lack of access to long-term financing*, due to absence of a revenue model; and, d) *complex stakeholder interests*, in the form of competing priorities, steep learning curve etc. As in the case of energy efficiency investments, Energy Service Companies (ESCOs) and other third party players have the potential of significantly scaling up distributed generation, but they face barriers in accessing adequate finance. Concessional finance that allows for a much higher degree of risk mitigation compared to on-grid RE financing, will be needed to get a lot of these projects off the ground. Concessional finance can support (a) lending for much longer tenors than MDBs to improve the project economics over business-as-usual diesel or other fossil fuel based distributed generation, (b) provision of subordinated loans to help establish viable business models and develop track records for fully commercial investors, and (c) provision of early stage equity to help new/start-up ventures off the ground.

Concessional financing from the CTF has the potential to reduce barriers and initiate scale up in each of these frontier areas. Annex 1 provides in more detail the value proposition that CTF could offer to these areas and help mobilize additional sources of financing.

3.3 New financing modalities

26. In a recent study[11], the Climate Policy Initiative (CPI) highlighted some of the comparative advantages of the CIF, including programmatic approach with scale of funding, *"flexible toolbox of instruments,"* and private sector engagement, in delivering climate finance and addressing barriers to the deployment and scaling-up of low-carbon technologies. Given its financial and operational strength, experience, investment focus and unique "MDB-collective" business model, the CTF is in a position to increase the scale and broaden the range of the capital it engages. In addition to the advantages highlighted above, the cost-effectiveness of the CTF is also noteworthy. When compared, in terms of

[11] Chiara Trabacchi, Jessica Brown, Rodney Boyd, David Wang, James Falzon, "The Climate Finance Landscape and the Role of the Climate Investment Funds", May 2016.

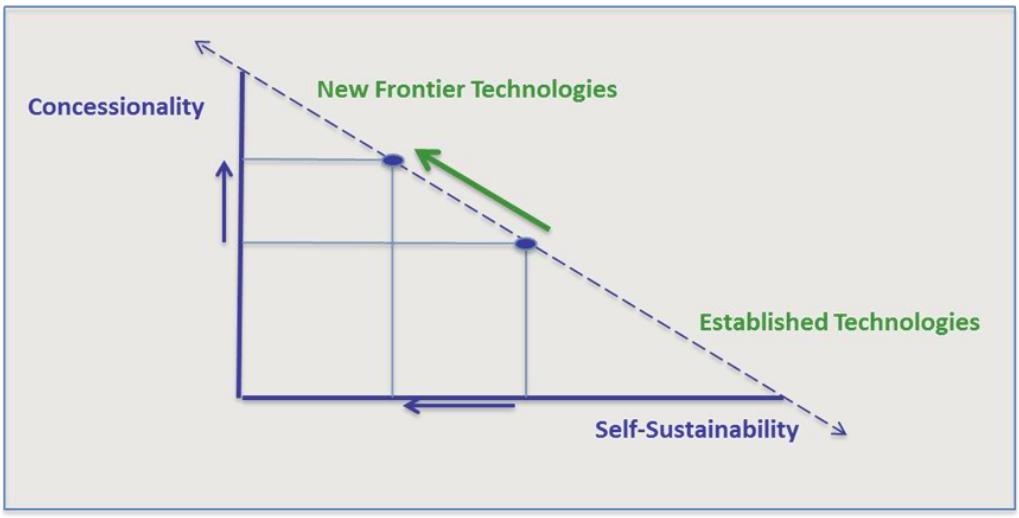
customary financial indicators, to other multilateral financing vehicles, the CTF has proven to be quite efficient in deploying scarce public resources. As a financing vehicle, liquidity of CTF is good and it has shown a positive (though small) return on equity[12].

27. With the above objectives in sight, two modalities, one involving a *securitization* approach and another involving issuance of *risk mitigation guarantees*, both using reflows from legacy assets, are being presented here. Also included is a preliminary analysis of various elements involved in the implementation of any of these modalities, which will need to be further assessed in order to identify the most appropriate option for further consideration by the Trust Fund Committee.

3.3.1 CTF Green Markets

28. CTF 2.0 introduces a financing structure capable of independently raising funds from institutional investors in the capital markets. This approach would not only place greater financial self-sufficiency at the heart of the CTF model but also encourage better matching of the economic characteristics of funded activities with appropriate financing—calibrating the trade-off between self-sufficiency, concessionality and any additional infusion of funds from contributor countries, according to policy objectives and risk appetite of the contributors (see Figure 4).

Figure 4: Self-Sufficiency, Concessionality, and Technology Mix



29. The goal would be to do more and better with less while exploiting fully the institutional legitimacy of the multi-MDB origination framework. Further, CTF Green Markets has been conceived to preserve flexibility and responsiveness in terms of CTF instruments deployed by MBDs across the next generation of low carbon investment projects, including new frontier investments.

[12] *New Financing Modalities for the Clean Technology Fund* (November 2015).

Concept

30. Under this model, a new legal entity would be established and new securities ("Green Bonds") would be issued in the international capital markets to finance a new generation of CTF projects. The reflows from this new generation of projects would then be used to repay bondholder obligations.

31. The Green Bonds issued by CTF Green Markets would be rated by international credit rating agencies. To ensure efficient market financing, the securities should target a minimum rating of Single-A. Because the creditworthiness of the obligors for this new generation of projects would be weaker than the Single-A target, credit enhancement in the form of overcollateralization would be employed. The existing portfolio of legacy CTF reflows would provide this overcollateralization. In the event that reflows from the new generation of projects is insufficient to satisfy repayment obligations to bondholders (e.g. due to credit losses, or the level of concessionality offered to financing recipients), legacy CTF reflows would be used to address such a shortfall.

32. One approach to preserve the current Loan Contributors' interests could be that the expected legacy CTF reflows to be used under the CTF Green Markets would be the remaining amount of such reflows after satisfying obligations to the Loan Contributors and payments for administrative costs. It is proposed that this and other potential approaches be explored in detail ahead of the next CTF TFC meeting.

33. It is also proposed that the CIF AU be mandated to compare and evaluate the benefits and challenges associated with different structural options for this modality (e.g. establishing a Special Purpose Vehicle ("SPV") to issue the bonds, or leveraging MDBs' financing capabilities to assist with this endeavor), and identify the most effective and efficient approach.

34. Key design features of CTF Green Markets benefit from institutional strengths of the existing CTF structure:

    a. Drawing full value from the pool of diversified MBD-originated CTF assets to back the new securities;

    b. The current set of CTF financing products (e.g. loans, equity, guarantee) offered by the CTF through the MDBs would remain under this proposal; and

    c. The following fundamental features of the CTF business model will remain in place under CTF 2.0: MDBs would remain the lenders of record and be responsible for loan servicing, on a limited recourse basis, for all assets they originate. As is currently the case, CTF would bear any losses on these loans and, accordingly, if the reflows were insufficient to cover CTF Green Markets' under the Green Bonds, investors in those Green Bonds would eventually suffer losses.

35. At the same time, the new structure would introduce innovative features that build on CTF's mission in keeping with new imperatives:

    a. Dynamic linkage of financing capacity with new asset generation would impose greater selectivity and efficiency in operational programming;

    b. Recurrent rigor of the credit rating process would reinforce discipline in CTF accounting and reporting;

c. The Green Bonds would be a unique well-rated asset in the debt capital markets; and

d. CTF Green Markets and the underlying collateral pool could be structured to sustain themselves as an evergreen market entity or to wind itself down over time.

Liquidity Management and Refinancing Risk

36. The maturity of Green Bonds would be as long-dated as investor demand will allow. However, it is unlikely that the duration of these liabilities would be as long as the average life of the new CTF Projects that the bond proceeds would finance. In other words, Green Bonds would need to be repaid sooner than the majority of loans need to be reimbursed.

37. The most efficient and common approach to address this asset/liability mismatch would be to refinance the obligations to bondholders by simply issuing new bonds and using those proceeds to repay the initial bonds at their maturity. This creates refinancing risk, or the risk that refinancing in this manner becomes temporarily unavailable due to a disruption in the capital markets. It is likely that the credit rating agencies would require some form of contingent funding facility be made available (possibly from CTF Contributors) to ensure that CTF Green Markets is able to meet its redemption obligations in respect of the Green Bonds if it is unable to issue new Green Bonds at that time. Following such a market disruption, when refinancing becomes available again, proceeds from a new bond issuance would be used to reimburse the contingent funding facility.

38. In the absence of a contingent funding facility, CTF Green Markets may need to reduce the volume of bonds it issues and new projects it finances.

Achievable Leverage

39. The CTF Green Markets program is an ambitious project, but it could establish a green issuance platform for the future. High impact projects with varies levels of concessionality could be supported, building on the current procedures, while maintaining the average 9x project leverage currently observed in CTF. Once the program is successfully established, it could be used to support many projects for years to come by raising new financing against a growing asset base.

40. A number of factors could significantly impact the capital-raising and project-funding capacities of CTF Green Markets, particularly the availability of a contingent financing facility. Based on preliminary modeling results, if such a facility were in place, it is reasonable to expect that CTF Green Markets could raise USD 4.25 billion through its first cycle of bond issuances relatively quickly (i.e. through a $500 - $750 million issuance every nine months). In the absence of a contingent financing facility, CTF Green Markets may only be able to raise $1.5 billion through its first cycle of issuances.

41. As the financing recipients repay their obligations associated with the new generation of projects, capital-raising capacity would rebuild, enabling CTF Green Markets to engage in additional cycles of bond issuances.

Topics for further detailed assessment

- Governance/legal framework, including obligations to loan contributors;
- Structure for bond issuance;

- Financial modeling;
- Credit rating assessment; and
- IBRD/MDB internal review and approval, as may be necessary.

3.3.2 Risk Mitigation Facility

Concept

42. The objective of the Risk Mitigation Facility (RMF) would be to scale up mobilization of local and international private capital for clean technology projects through provision of risk mitigation guarantees by utilizing expected legacy CTF reflows.

43. One approach to preserve the current Loan Contributors' interests could be that the expected legacy CTF reflows to be used under the RMF would be the remaining amount of such reflows after satisfying obligations to the Loan Contributors and payments for administrative costs. It is proposed that this and other potential approaches be explored in detail ahead of the next CTF TFC meeting.

Structure and institutional coordination

44. The proposed RMF would be established and operated by IBRD on behalf of the CTF. To maximize the impact of leveraging, the RMF would be flexibly designed to include other participating CTF-MDBs to offer the products.

45. This structure could combine the deep sector knowledge of the MDBs through their country engagement and their significant experience of designing and structuring risk mitigation instruments, along with their experience in scaling up clean energy and climate finance with CTF resources and their ability to leverage CTF's climate finance track record and reflows. At this stage, RMF is contemplated to be offered to CIF/CTF beneficiary countries through MDBs as a WB/IBRD-CTF facility. The exact structure would be confirmed once feedback on institutional structure and further credit analysis and legal review are received from relevant stakeholders (Contributors, MDBs, etc.).

46. IBRD would establish and manage the RMF. For participating MDBs to make use of RMF guarantee products, an Umbrella Agreement would be entered with all MDBs that would set out common terms and conditions for all MDBs to offer RMF guarantees to projects across the regions. IBRD would also provide liquidity management support to RMF guarantees issued by MDBs by setting aside an adequate level of collateral from the legacy CTF reflows, prudent issuance of guarantees, monitoring and supervision of projects. It is expected that all RMF guarantees would be issued on a non-accelerable basis which means that guarantee payout, if any, would be made only on the scheduled debt service basis and not as a single/bullet payment. Such non-accelerable guarantees would smooth out the payouts and pressure on use of CTF reflows.

Achievable leverage

47. To mobilize capital at scale for climate financing, the RMF would need to have substantial capital. The RMF could be initially sized at USD 1 billion[13] through ring fencing USD 1.25 billion of legacy CTF

[13] To be confirmed after IBRD and CTF approval of reflows.

reflows. The excess reflows of USD 0.25 billion would be used to provide liquidity and internal credit enhancement of the underlying portfolio. This would enable leverage by the RMF of between USD 4 billion to USD 6 billion within five years of its establishment, based on preliminary assessment. Further expansion of the RMF could be funded through bond issuance proceeds from CTF Green Markets, if deemed appropriate, or through expansion, on a standalone basis, by increasing the amount of legacy CTF reflows ring-fenced for this purpose.

Topics for further detailed assessment

- MDB clearances and approvals;
- Governance/ legal framework, incl. obligations to loan contributors;
- Financial modelling; and
- Establishment of Umbrella RMF Agreement.

4 Next steps

48. Further work is required to fully develop the proposals for new financing modalities. Some of the steps include, but are not limited to:

- Consultation with contributor countries on making available the reflows and other available assets in the CTF trust fund and all necessary arrangements;
- Exploration of all modifications required in current legal agreements and CTF documents;
- Financial due diligence to analyze different scenarios and determine the potential scale of funding possible under CTF 2.0;
- Credit assessment of legacy assets from CTF 1.0 to determine the feasibility and potential scalability of CTF 2.0;
- Due diligence to identify and establish the legal framework necessary for the implementation of the new modalities;
- Other elements as determined relevant to operationalizing CTF 2.0; and
- Institutional arrangements and implications.

Preliminary budget

49. Below is an indicative assessment of costs expected to be incurred by the CIF AU, Trustee and MDBs, as required, in order to develop the modalities further for consideration by the Trust Fund Committee in December, 2016:

• Financial modeling/ structuring	USD 400,000
• Credit rating	USD 300,000
• Legal assessment, due diligence and drafting	USD 300,000
TOTAL	**USD 1,000,000**

These indicative costs have been included under the Special Initiatives budget in FY17 CIF Business Plan and Budget document, Joint CTF-SCF/16/4.

Annex 1: Concept notes for new frontiers

I. Energy storage

50. Energy storage is emerging from niche applications (such as islands and mini-grids) to economic viability in mainstream settings (such as frequency regulation). The key market drivers for this recent emergence are the falling cost of components and the growing demand to manage the intermittent and distributed nature of renewables, as well as to improve grid efficiency.

51. The focus on storage is relevant for a number of reasons. First, increased penetration of intermittent renewable energy sources causes imbalances in the grid that must be managed by increasingly expensive peaker plants. Second, aging transmission and distribution networks create bottlenecks that prevent cost-effective sources of energy from reaching the areas where it is needed most; moreover, the costs of laying down new lines are extremely high. Third, excess energy produced that cannot be absorbed by the grid is wasted, while at the same time there are reliability issues related to the existing sources of supply. These challenges can be addressed by pairing renewable energy sources with energy storage.

52. Despite the benefits, there are barriers to the widespread implementation of storage technologies, including:

    a. Cost of the technology and payback time, as peaker plants or backup generators still provide more value currently
    b. Lack of regulatory clarity, for example, how to treat use of distributed storage to provide transmission and distribution services, role of grid operators, etc.
    c. Uncertain revenue streams
    d. Access to commercial finance

53. Energy storage is at the threshold of becoming economically viable, similar to the status of the solar photovoltaic (PV) industry a decade ago. Access to concessional financing can facilitate the penetration and scaling-up of storage technologies through interventions that help bridge the gap to commercial project viability, mitigate real and perceived business risks, finance first-mover projects, and support technical assistance work to promote regulatory framework convergence and establish testing and certification standards to ensure quality and reliability.

54. The applications of storage include the following:

    a. Load management and arbitrage, the most basic grid storage application, i.e., buying energy cheap, storing it, and reselling it at a higher price to meet peak demand
    b. Grid scale renewables integration, given variability of wind and solar generation
    c. Distributed solar PV integration
    d. Residential solar PV time shifting, storing energy produced through solar home systems or rooftop PV arrays for use when needed, not just when the sun is shining

e. Demand response, temporary reduction to a consumer's electricity usage in response to power grid needs or shifting the electricity usage during periods of peak demand or other grid constraints

II. Energy efficiency in the buildings sector

55. In the coming decades, rapid urbanization, mostly due to population growth and urban migration, will put cities at the heart of economic development, energy consumption and greenhouse gas emissions. Buildings account for 15 percent of emissions today and emissions are expected to double by 2030 with almost all of this increase coming from the developing world. As a result, putting in place the right policies for sustainable urban development can have a huge economic and social impact as well as bend the trajectory for reducing greenhouse gas emissions globally.

56. More than 1.25 billion square meters of buildings—almost double the size of Singapore—will be registered, renovated, or certified as green building space over the next five years under ambitious commitments made by Green Building Councils at COP21 in Paris. Pledges from the developing world include Brazil, Colombia, Panama, Tanzania, Kazakhstan, and others. China's INDC targets 50 percent of new construction by 2020 as being green. India's activities include building efficiency codes. More than 125 corporate members of Green Building Councils made bold commitments and a new alliance of 16 countries and over 60 organizations, known as the Global Alliance for Buildings and Construction, was launched and publicly committed to help countries meet their INDCs.

57. Barriers still remain in the form of, among others:

    a. Higher costs, which may range from negative 0.5 percent to 12 percent higher than traditional builds
    b. A lack of any single player in the market to absorb additional costs (immediate affordability outweighs energy and water savings and long term appreciation)
    c. A lack of a system to validate savings that hinders flow of capital to the sector
    d. A lack of information in the market on financial benefits of green buildings even though the experience across developed countries provides a very compelling case

58. While many admit that green buildings may present a financially sound proposition, there is reluctance to take on the risk of higher upfront cost combined with an unknown pattern of returns. This is where concessional finance can be critical, either absorbing incremental cost associated with "greening" a building (either at construction, financing, or end-user level) or providing performance assurances. The latter can be achieved either by putting in place financial structures that can protect the overall investment returns or by establishing a standardized certification process that would guarantee a certain minimum level of performance. It is expected that with rising experience and market penetration, the benefits of green buildings will become thoroughly understood, market demand will accelerate, and fully commercial financing for green buildings will follow.

59. Support from CTF through a DPSP-type program could help to expand and scale MDB activities into CTF countries such as India where there is high demand. Activities recently supported by the MDBs in the sector include the following:

a. Green credit lines for retrofits/ efficient building solution providers (e.g. manufacturers of efficient lighting)
b. Programmatic support to scale green building certification programs that help channel investment preferentially to green assets
c. Green construction finance for new builds
d. Green mortgage lines to encourage householders to buy green homes.

III. Sustainable transport

60. Transport accounts for 23 percent of global (non-agricultural) CO_2 emissions with three quarters from on-road vehicles. It is the fastest growing sector, and business-as-usual projections suggest that by 2030 transport emissions are expected to increase by roughly 70 percent, predominantly in emerging economies. The good news is that it is possible to change to a lower carbon transport system, and doing so would generate significant co-benefits such as reduced congestion, pollution and accidents, improved health, quality of life, enhanced productivity and economic growth.

61. This transformation is complex and capital intensive, estimated at USD 3 trillion between 2015 and 2035. Much of it must be implemented in sub-national or private sector investments and partnerships. Large investments are also needed to make transport infrastructure resilient to climatic events such as flooding, landslides, coastal sea level rise, and storm surges. By some estimates, losses in transport due to climatic events accounted for up to 40 percent in losses. For a variety of reasons, including methodological and substantive concerns related to dynamic baselines and leakages, it remains difficult to take advantage of secondary sources of financing like carbon markets.

62. Particularly in urban areas the change process also requires a series of enabling investments— such as those in quality public transport and walking and cycling infrastructure—to be accompanied by politically challenging "green urban mobility" policies that ensure that auto-mobility is not implicitly subsidized. Though many of the investments, such as those in public transport, generate significant economic co-benefits, revenue generating ability is often limited by affordability concerns. Even operational cost recovery is often a challenge, making it difficult to attract private sector funds at scale.

63. There is significant need and a strong rationale for concessional finance from the CTF to support climate-smart transport investments. The MDB-CIF relationship is an optimal vehicle for the delivering the desired results for the following reasons:

    a. The MDBs are critical to managing the governance and risks that are typical to complex, sub-national transport investments that involve environmental, social, inter-governmental, and public-private issues.
    b. The MDBs bring trusted long-term relationships that allow them to work effectively with sub-national, municipal, national, and private sector actors.
    c. A programmatic (vs a project-by-project) approach is required for the types of transformative, systemic investments that will be required, whether with sub-national interventions or for private sector-led initiatives.

64. Some examples of activities that could be supported by the CTF in the sector include the following:

    a. Low-carbon urban mobility, such as transit-oriented land development, investments in public transport (including public-private partnerships), non-motorized transport, as well as low emission modes, investments and policies to address auto use
    b. Low-carbon freight transport, including regulatory reform and market support to incentivize vehicle modernization, supply chain development, freight modal shift and multi-modal systems, heavy duty vehicle efficiency standards and re-engineering, and voluntary green freight approaches
    c. Climate resilient infrastructure to ensure that transport nodes, both public and privately operated, remain available in the face of climate change
    d. Development and implementation of national/regional policies and regulations, such as fuel subsidy removal, pricing policies for private motorization, urban development policies (land use regulations and fiscal policies and vertical building regulations), regulatory simplification in the freight sector, new vehicle technology standards, vehicle fleet maintenance and renovation programs, and siting of new connection systems (e.g., roads, waterways)

IV. Distributed generation

65. Distributed energy generation refers to power produced at the point of consumption. Two primary forces will drive the growth of distributed generation in coming years: rising peak energy demands through localized energy solutions (peak shaving), and access to the 1.1 billion people who still lack basic energy services. Distributed generation assets are modular and adaptable to a variety of applications and hence are best suited to address both these needs.

66. Global distributed energy capacity additions are expected to surpass new centralized generation capacity additions in 2018 and remain so until 2023. Roughly half of the estimated 165 GW of the total annual installed capacity in distributed generation will be in emerging markets in the 2014-23 period. While a large portion of this growth will be from increased use of diesel generation sets, the global distributed solar PV (typically < 1 MW) annual capacity additions are expected to grow from 20 GW in 2015 to over 30 GW in 2020 (USD 70 billion market), topping 50 GW in 2024 (USD 80-90 billion market), with half of the market in developing countries.[14]

67. Like most investments in new and emerging sectors, distributed generation investments offer insufficient risk-reward to private sector investors and to lenders for a variety of reasons, including these:

    a. Distributed generation investments face significant regulatory risks because there is a lack of specific policies for guidance and execution of renewable energy distributed generation projects.
    b. Renewable energy distributed generation faces strong competition from lower cost natural gas generation. For commercial and industrial customers seeking captive power generation, natural gas gensets provide a cheaper alternative with a greenhouse gas reduction

[14] IFC Climate Implementation Plan 2016 Report derived from: BNEF 2015 *New Energy Outlook*.

component compared to their diesel counterparts, while offering a better power factor than solar PV.

c. Distributed generation project developers lack access to long-term financing because of the largely untested nature of renewable energy distributed generation systems and their revenue model.
d. Renewable energy distributed generation is a multi-stakeholder project development and operation environment, which involves grid companies; consumers; financial institutions; project developers; engineering, procurement, and construction companies; and the roof owners of schools, residences, hospitals, factories and buildings. Achieving alignment of interest between the various stakeholders is challenging as one side could stand to "lose" from the success of another. This multi-stakeholder environment is further complicated due to the steep learning curve for first-of-its type projects in developing countries and lack of established supply chains for developers.

68. Thus, significant efforts are needed to de-risk the distributed generation investments through a supportive regulatory environment that provides a higher degree of certainty for equity and debt investors to earn commensurate reward for assuming high levels of risk.

69. Given these barriers, concessional finance from the CTF that allows for a much higher degree of risk mitigation compared to on-grid renewable energy financing, will be needed to get distributed generation projects off the ground. Concessional funds offer three advantages:

    a. Lend for much longer tenors than the MDBs to improve the project economics of renewable energy distributed generation over business-as-usual diesel or other fossil fuel based distributed generation
    b. Provide contractually subordinated loans to help establish viable business models and develop track records for fully commercial investors
    c. Provide early stage equity to help new/ start-up ventures off the ground