

CLIMATE INVESTMENT FUNDS

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Agenda Item 3

STRATEGIC DIRECTIONS FOR THE CIF

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Executive Summary

1. In 2008, global leaders recognized the enormity of the climate challenge and responded by establishing the Climate Investment Funds (CIF) to provide scaled-up financing to contribute to the demonstration, deployment, and transfer of low-carbon and resilient climate solutions with a significant potential for long-term transformational change across key markets and sectors.
2. Ten years on, the CIF has delivered on its founding ambitions and has been a key player in channeling unparalleled levels of climate finance to developing countries. Globally, CIF investments are supporting 26.5 gigawatts in new clean power capacity, improved energy access for 8.5 million people and over 300,000 businesses, greater climate resilience for 45 million people and 44,000 businesses, and 36 million hectares of more sustainable forests.
3. Despite these significant results, many hard-fought successes and lessons learned, the climate financing gap remains enormous with current estimates indicating that global annual investment of around USD 6.9 trillion over the period 2016 to 2030 may be necessary to put emissions on a pathway in line with a 2°C scenario.
4. The reality is that financing is yet to catch up with political commitment.
5. As the climate finance community looks to respond to growing global climate needs and ambition, this paper seeks to synthesize what we have learned from CIF's 10 years of supporting transformational change in climate change. It also presents ways through which the international community can continue to maximize the advantages of CIF's proven business model to support future climate action.
6. In line with CIF's founding mandate to serve as a learning laboratory for scaled-up climate finance, an Evaluation and Learning (E&L) Initiative was commissioned in 2016. The initiative is producing 30 studies and activities to enable learning that is relevant, timely, and informative for multilateral climate finance strategy development and decision making.
7. The initial findings of these independent studies reveal that the CIF business model is both unique among climate funds and is systematically contributing to transformational change outcomes across several country contexts and change dimensions. The evaluations have found the following:
 - The CIF's **programmatic approach** makes a substantial contribution to ensuring that country programs support national priorities and transformational change and significantly enhances knowledge and learning.
 - **Delivering finance through multilateral development banks (MDBs)**, in a coordinated manner, contributes to design of large-scale, coherent intervention packages that help move markets.
 - The **scale, concessionality, and certainty** of CIF resources help effectively engage MDBs, government, and private sector actors in the investment planning process and positively influences the types of projects CIF supports: innovative and first-of-a-kind projects, alongside programs that address multiple barriers in pursuing climate-smart development.

- CIF's business model **supports social inclusion**, including improved gender mainstreaming; advancing women's voice, skills, and livelihoods; and giving voice to indigenous peoples and local communities in decision making.
8. Over the last 10 years, the CIF has fine-tuned a highly effective and efficient business model that has delivered transformational change through the MDBs that continue to play a key role in helping developing countries accelerate towards a low-carbon and climate-resilient future.
 9. There is now an important window of opportunity to build on the success of the CIF business model and harness its assets to deliver on emerging priorities and push technological frontiers further and faster.

1 Introduction

1. This strategic paper seeks to synthesize what we have learned from the Climate Investment Funds' (CIF) 10 years of supporting transformational change in climate action, and to present ways through which the international community can continue to maximize the advantages of its proven business model to support future climate action. The paper is expected to support the strategic discussions on the future of the CIF¹.

1.1 Urgency of climate action and the present funding gap

2. The science is clear: sea levels are rising at the fastest recorded rate in 2,000 years², threatening coastal communities, low-lying areas, and many of the world's cities. Carbon dioxide levels in the atmosphere are soaring and currently at the highest concentrations in 800,000 years³. Eighteen of the 19 warmest years on record have happened since 2001⁴.
3. The most recent special report of the Intergovernmental Panel on Climate change (IPCC) indicated that "Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate⁵."
4. The IPCC has also concluded that we face a closing window of opportunity of just 11 years to enact the unprecedented, "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities needed to overcome the existential threat of climate change.
5. Climate action is most urgently needed in developing countries, who are less likely to have sufficient resources to adapt to a changing climate and to transition from a fossil fuel-based energy economy (based on their higher poverty rates, climate-sensitive natural resource base, and level of infrastructure development).
6. The window for transitioning onto a sustainable pathway is closing fast. The world is expected to invest some USD 90 trillion on infrastructure by 2030. That is more than the entire current stock today and much of this investment will be programmed in the next two to three years. We face a unique window of opportunity to ensure that investments flow into the kinds of infrastructure projects that do not lock countries and communities into a high-polluting, low productivity, and deeply unequal future, but instead deliver a new era of economic growth.

¹ As indicated at the Joint Meeting of the Clean Technology Fund (CTF) and Strategic Climate Fund (SCF) Trust Fund Committees of the CIF in June 2016, discussions on the sunset and strategic future of the CIF will begin in January 2019, in order to take a decision in June 2019 on whether, and when, the Trustee should stop receiving new contributions for the CTF and/or the SCF.

² <https://www.pnas.org/content/108/27/11017>

³ <https://scripps.ucsd.edu/programs/keelingcurve/2018/05/02/carbon-dioxide-in-the-atmosphere-hits-record-high-monthly-average/>

⁴ <https://climate.nasa.gov/vital-signs/global-temperature/>

⁵ See http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf

2 CIF in the climate finance architecture: 2008 to 2018

2.1 Creating CIF

7. In 2008, the fight against climate change was in a much more nascent phase than today. At the time, a growing body of research was making it abundantly clear that increasing CO₂ emissions were driving climate impacts. The IPCC's 4th assessment noted in 2007 that global greenhouse gas (GHG) emissions due to human activities had increased 70 percent between 1970 and 2004. It concluded that "warming of the climate system is unequivocal" and that "all continents and most oceans shows that many natural systems are being affected by regional climate changes."
8. Efforts to address these challenges were, in part, hampered by the high cost and widespread unfamiliarity of many low carbon technologies. For example, the installed cost of a solar photovoltaic (PV) system was around USD 8,000/kW in 2008 (compared to less than USD 2,000/kW in 2018). By the end of 2007, only 10 gigawatts (GW) of solar capacity were installed around the world (compared with approximately 500 GW today). In 2007, clean energy investment totaled only USD 182 billion, with much of that in developed countries.
9. Compounding this challenge was the emerging global financial crisis, which by late 2007 had roiled the financial markets and made lending, especially for emerging and "risky" technologies, such as clean energy, increasingly scarce. At the same time, the UNFCCC process was making slow progress on coordinated climate action at a global scale.
10. To address this challenge, in 2008, leaders of the G8 decided during a Summit in Hokkaido, Japan that a fast-moving, multilateral response was required to address the climate challenge. MDBs were widely recognized as the leading institutions in driving scaled-up action across sectors in developing countries. However, MDBs had yet to prioritize or mainstream climate action in their operations and were a few years away from establishing climate investment targets.
11. In the months and years that followed, it was recognized that given a large-scale, flexible, and concessional funding tool, MDBs had the expertise and scale to lead on four priority areas in dire need of a strategic, programmatic "push:"
 - a) Scaled-up financing for low-carbon technologies
 - b) Sustainable forestry
 - c) Coordinated resilience efforts at scale
 - d) Demonstration of viability of renewable energy in low income countries
12. The establishment of CIF in 2008 marked the first time the international community placed a significant amount of resources in a dedicated funding vehicle to support developing and emerging economies in adopting a low-carbon and climate-resilient development pathway. It was created to fill an important gap in climate finance, and drive large-scale, innovative, first-of-its-kind investments in climate mitigation and adaptation in developing countries and in partnership with contributor and recipient countries, MDBs, the private sector, and CIF observers. At its core,

CIF was intended to help build new markets in renewable energy technologies, enable wider energy access, and shift institutional incentives for investments and strategic development in forest management and resilience—in short, to help drive the climate action agenda within pilot countries and MDBs.

13. Today, CIF is a multilateral climate fund of more than USD 8 billion that works exclusively through six MDBs⁶. The CIF business model leverages the expertise, standards, and global reach of the MDBs to drive climate action at scale through both advisory and investments in 72 developing countries.
14. CIF addresses the two main gaps and barriers to climate investments for many developing countries: 1) lack of access to affordable, risk-appropriate long-term capital and 2) non-financial barriers such as weak capacity and policy gaps. The CIF's innovative programmatic approach – pairing broad-scale investments with country planning, domestic policy changes, and consultations with a wide number of stakeholders – provides much-needed predictability for recipient countries and coherence for all actors.
15. CIF includes the Clean Technology Fund (CTF) and Strategic Climate Fund (SCF), which includes the Scaling Up Renewable Energy in Low-Income Countries Program (SREP), the Pilot Program for Climate Resilience (PPCR) and the Forest Investment Program (FIP).

3 CIF achievements to date

16. Now, marking 10 years of climate action, CIF financing is supporting 26.5 GW in new clean power capacity, improved energy access for 8.5 million people and over 300,000 businesses, greater climate resilience for 45 million people and 44,000 businesses, and 36 million hectares (ha) of more sustainable forests. It is unlocking over USD 55 billion in climate change investments across 72 developing countries, supporting hundreds of programs that would not have happened without CIF's concessional and risk-absorbing capital and demonstrating that CIF's business model is conducive to transformational change. This funding, coupled with the policy support and facilitated MDB-to-MDB cooperation that have become a CIF trademark, are helping to deploy technologies around the world that make significant impacts in beneficiary markets.

3.1 CIF Program Results and Outcomes in Focus

17. The **Clean Technology Fund (CTF)** was established to provide scaled-up financing to developing countries for the demonstration, deployment, and transfer of low-carbon technologies with a significant potential for long-term greenhouse-gas emissions savings. It is the largest multilateral fund dedicated to climate mitigation. CTF objectives are to finance transformation through large-scale financing of low-carbon technologies and innovative business models in energy efficiency,

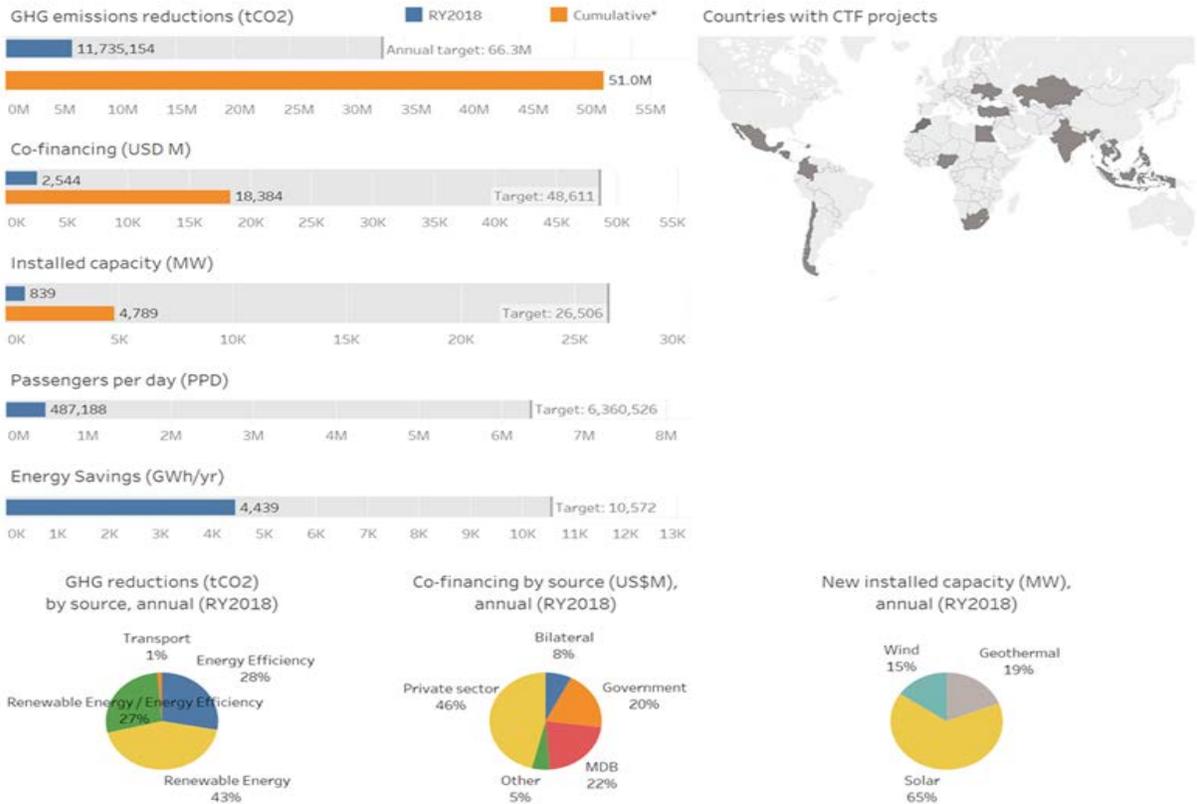
⁶ These include the African Development Bank (AfDB), the Asian Development Bank (ADB), the European Bank of Reconstruction and Development (EBRD), the Inter-American Development Bank (IDB), the International Finance Corporation (IFC), and the World Bank (WB)

renewable energy, and sustainable transport while providing experience and lessons in responding to the challenge of climate change through learning-by-doing.

18. During the past 10 years of operation, the USD 5.5 billion CTF has financed the development and implementation of low-carbon investment plans in 15 middle income countries, a regional program on concentrated solar power (CSP) in the Middle East and North Africa, and three phases of its Dedicated Private Sector Program (DPSP). The CTF portfolio encompasses large-scale investments in energy efficiency in industrial, commercial, and residential sectors; renewable energy technologies ranging from solar to geothermal, wind, and biomass; and sustainable urban transport for public transit, hybrid buses, and green logistics.
19. CTF has been at the forefront of financing clean technology innovation and market transformation, addressing key barriers preventing larger scale deployment of technologies like CSP and geothermal power.
20. CTF-funded projects account for about 15 percent of the current global CSP installed capacity and has contributed to the global cost reduction in the CSP technologies. For example, in South Africa, the 100 MW KaXu Solar One project, supported by USD 26.5 million from CTF, became the first operational private sector utility-scale CSP plant in the developing world, serving as a benchmark to other countries. In Morocco, CTF invested more than USD 500 million in multiple tranches in CSP and played a catalytic role in cementing the government's commitment to transitioning to sustainable energy through CSP and other renewables (e.g., wind and hydropower).
21. Geothermal is another example where concessional finance from the CTF (and SREP) has aimed to mitigate technology risks to unlock private sector investments. CTF interventions target the upstream geothermal drilling, where the risks are the highest and investment barriers are most prevalent. Through CTF support, 10 countries have embarked on geothermal projects, ranging from Indonesia to Chile, Mexico, Turkey, Nicaragua, and the Eastern Caribbean countries. These projects are expected to result in almost 2.4 GW in clean power, which is about 17 percent of the current installed geothermal power capacity worldwide.⁷
22. Overall, strong results from the CTF portfolio have emerged (see Figure 1). For the current 85 CTF projects under implementation (totaling \$4.7 billion in CTF funding), expected results include mobilization of \$49 billion in co-financing from other sources (more than \$18 billion has materialized already), 26.5 GW of power generation capacity from renewable energy (nearly 5 GW has been achieved already), and more than 10,000 GWh of electricity savings annually. **Lifetime GHG emissions reduction from these projects will amount to approximately 1.4 billion tons of CO₂, approximately three times the annual GHG emissions in France.**

⁷ Between CTF and SREP, the CIF has supported about 20 geothermal projects to enable installation of approximately 3 GW of clean power. These geothermal plants, once completed, would account for over 20 percent of the current total global installed capacity of geothermal power generation.

Figure 1: Summary of CTF target and achieved results



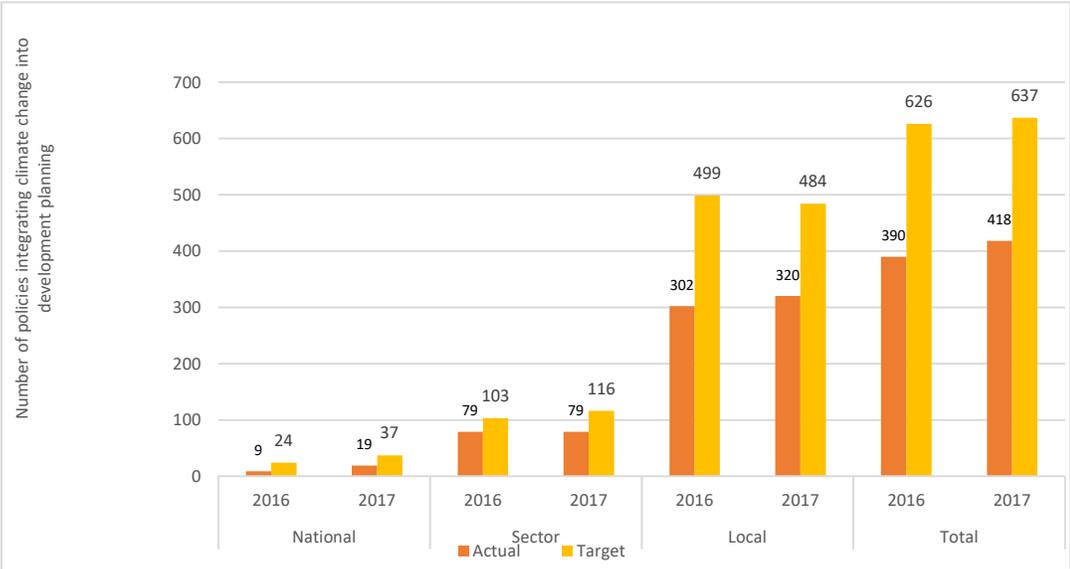
Source: 2018 CTF Results Report

23. The **Pilot Program for Climate Resilience (PPCR)** was established to assist governments in integrating climate resilience into development planning and service delivery and test new approaches to adaptation investments at scale. The USD 1.2 billion program is the only adaptation financing window that adopts a programmatic approach to address climate risks and embed resilience objectives in project design and implementation. It seeks to bring transformative change in countries by giving them a platform to pilot innovative ways and mechanisms to enhance resilience and maximize synergies and co-financing opportunities with MDBs, donors, the private sector, and other development partners.
24. For the past 10 years, PPCR has supported the development of adaptation investment plans, also known as Strategic Programs for Climate Resilience (SPCRs), of 28 developing countries and two regions (Pacific and Caribbean).
25. The concessional financing and the unique programmatic business model offered under PPCR has encouraged developing countries to focus on developing a framework for effective resilience planning and implementation. The countries have moved away from the project-by-project approach to address climate risks, committing, instead, to a long-term and strategic arrangement

of linked investment projects and activities aimed at achieving large-scale impacts and building the capacity of their institutions to integrate adaptation and resilience in their programs and operations. Countries like Zambia, Mozambique, Cambodia, Bangladesh, and Nepal have been able to improve capacity and institutional framework to integrate resilience objectives into strategies of vulnerable economic sectors and project investments.

26. Strong results on the ground demonstrate that PPCR contributes to transformational changes in pilot countries. At the end of December 2017, PPCR had helped to integrate climate change in 320 local/community development plans or strategies, 79 sectoral plans or strategies, and 19 national development plans or strategies across 15 countries. By the end of the program, PPCR is expected to support the integration of climate change considerations into more than 637 national, sector, and local policies and strategies (see Figure 2).

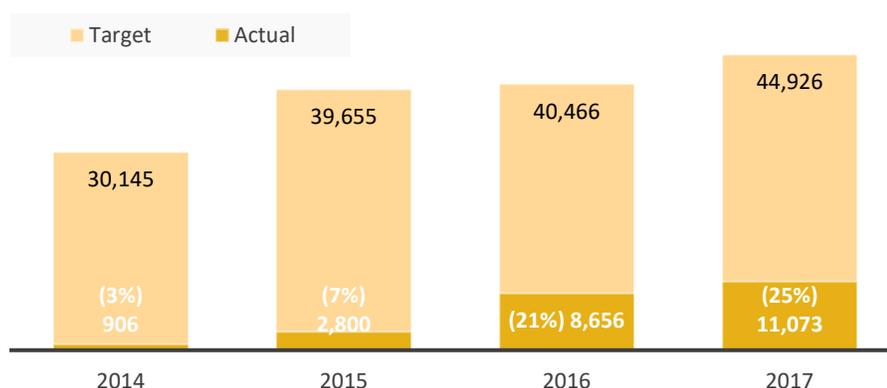
Figure 2: Integration of climate change into development planning by government level supported by PPCR as of December 2017



Source: PPCR

27. PPCR has also supported more than 11 million people across 16 countries in coping with the adverse effects of climate change through the implementation of various programs and projects. This number is expected to reach more than 45 million of which 49 percent are women after program completion (see Figure 3).

Figure 3: Number of people supported by PPCR from 2014 to 2017 (,000)



Source: PPCR

28. The scale, concessionality, and predictability of PPCR resources has helped to effectively engage MDBs, government, and private sector to support the development and delivery of first-of-a-kind climate innovations and technologies that help people at risk build their resilience and adapt to climate disasters, climate vulnerability, and climate change. For example, PPCR has supported the following:

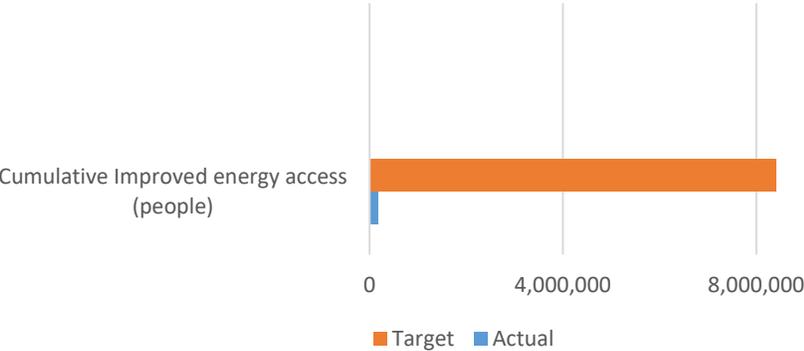
- a) Transformation of more than 123,928 ha of land and water (67 percent of 185,379 ha cumulative target) through sustainable land and water management practices
- b) Construction and rehabilitation of 1,002 kilometers (km) of roads (58 percent of 1,718 km targeted)
- c) Creation of climate adaptation financing facilities that have supported more than 1,879 households (141 percent of the target of 1,334) and 1,267 small businesses (462 percent of the target of 125)

29. The **Scaling Up Renewable Energy in Low-Income Countries Program** (SREP) empowers transformation in developing countries by demonstrating the economic, social, and environmental viability of renewable energy. Its investments create new economic opportunities and increase energy access through renewable energy in low income countries. SREP started in 2010 with approximately USD 300 million in pledges and contributions and a group of six pilot countries. In 2012, six new countries were added, and in 2014, another 14 countries were selected. SREP now consists of 27 pilot countries, with total funding resources of USD 745 million.

30. For the current 32 SREP projects under implementation (totaling USD 366 million in SREP funding), expected results include 3,300-gigawatt hours per year (GWh/yr) of renewable energy electricity (equivalent to the annual electricity production of Nepal), new or improved energy access for 8.4 million people (approximately the population of Sierra Leone), and 2.4 million tons of CO₂ equivalent per year in avoided GHG emissions. See Figure 4 for target and actual results on people benefitted with improved energy access. Figure 5 shows two other relevant indicators: the

installed capacity, and the co-financing, which measures direct finance investments leveraged through SREP funding from both public and private sources.

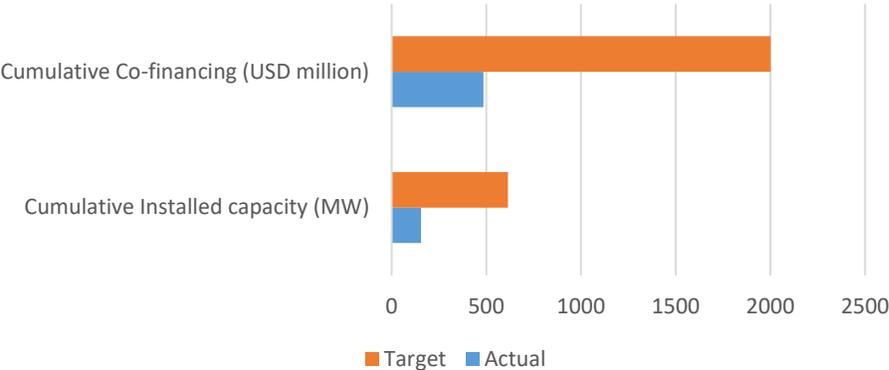
Figure 4. Number of people supported by SREP in MDB approved projects



Source: SREP

31. SREP long-term concessional finance has played a major role in enabling MDBs and recipient countries to pursue projects that might not otherwise have been considered bankable and were otherwise unlikely to have been pursued at all (or within a reasonable timeframe). For example, concessional funds were identified as catalytic in unlocking investments in geothermal in Kenya, by helping to address early stage exploration risks. In Rwanda, USD 50 million in SREP support was crucial to establishing the Renewable Energy Facility. It is designed to overcome the barriers hindering the growth of off-grid electricity markets in a country where only around 15 percent of rural households have access to electricity. CIF and partner investments will directly benefit 1.8 million people, facilitate private sector participation, and accelerate the country’s progress toward an ambitious goal of universal energy access by 2024.

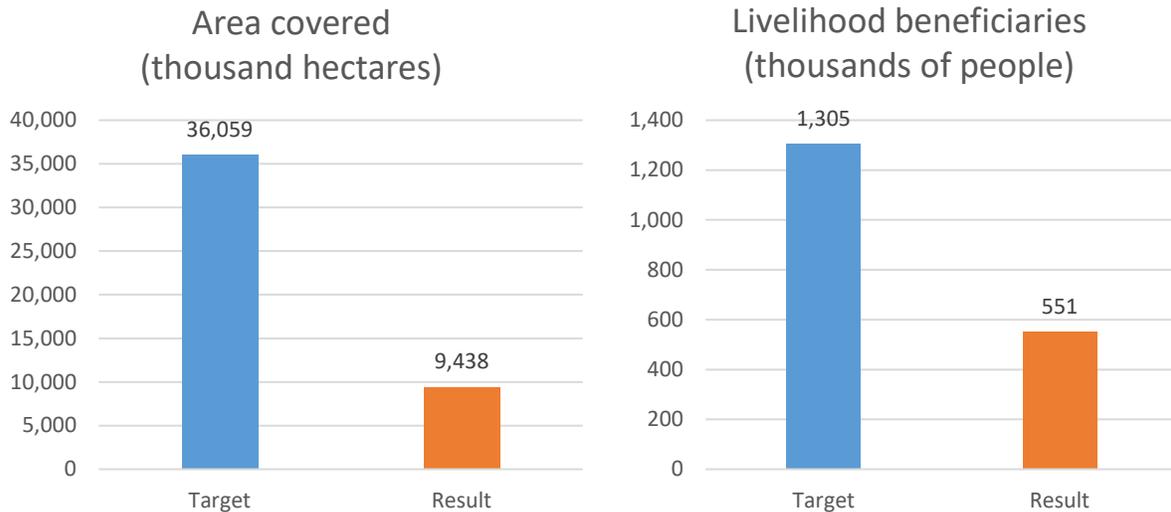
Figure 5. Co-financing and Installed Capacity in SREP MDB approved projects



Source: SREP

32. SREP is also supporting the testing of business models and demonstration projects that can serve as the basis for future scaling. More than USD 200 million in allocated SREP funding and technical assistance grants is helping to develop markets for renewable energy mini-grid systems that can efficiently address energy access needs in 14 countries. In Mali, SREP is demonstrating that electricity supply costs to customers in rural areas can be reduced by transforming diesel-based mini-grids into hybrid mini-grids using solar PV. The project supports a more systematic approach to rural electrification through the standardization of hybrid mini-grids in rural areas, transforming them into the least cost off-grid electrification option in Mali. Similarly, SREP is enabling Haiti to leap-frog into the adoption of renewable technologies for household consumption, productive uses, and provision of community services. The demonstration effect of the solar PV plus battery storage facilities will increase the attractiveness of similar investments to private sector investors and donors interested in on- and off-grid renewable energy electrification.
33. The **Forest Investment Program (FIP)** was established to finance efforts to address the underlying causes of deforestation and forest degradation and to overcome barriers that have hindered past efforts to do so. FIP addresses these challenges and delivers systemic change through coordinated multi-level efforts that involve supporting the development of suitable policy, social, and governance frameworks, using concessional finance to create economic and financial incentives that counteract prevailing market dynamics, and changing mindsets among key constituencies.
34. Since its creation, the USD 750 million FIP has financed the development of forestry investment plans in 21 countries and implemented 14 of them, as well as a USD 17 million private sector set-aside window and a USD 80 million Dedicated Grant Mechanism for Indigenous People and Local Communities (DGM). By focusing on a limited number of pilot countries, FIP has been able to offer envelopes that are large relative to other forest funds, allowing for impactful investments.
35. Much of FIP portfolio is at an early stage, with 36 percent of projects still under development and an additional 36 percent of projects only in their first two years of implementation. Despite this, important results have been achieved. For the current 30 projects reporting on results as of end December 2017 (totaling USD 390.43 million in FIP funding), expected results include 15.66 MtCO₂e of GHG emission reductions or avoidance; 36 million ha of land brought under sustainable management (roughly the size of Japan), of which 9.4 million has been achieved already; and directly improving the livelihoods of 1.3 million people, with more than half a million already benefiting (see Figure 6).

Figure 6: Summary of FIP target and achieved results as of December 2017



Source: FIP

36. Considering the complex and deep-rooted systemic failures in the forest sector, an important achievement of FIP has been to provide an opportunity to enable high-level political engagement and lend a voice to responsible ministries, who often have limited ability to convene inter-sectoral dialogue. For example, in Brazil, FIP has resulted in a novel inter-ministerial arrangement between four ministries. It aims to develop a new paradigm that combines modern and sustainable agriculture with the conservation of natural resources and the promotion of human well-being in the Cerrado biome. In Ghana, FIP is supporting the transition to climate-smart cocoa production and piloting a tree tenure system that benefits communities. This is a foundation for sustainable development that is good for the environment, the people, and the climate.
37. FIP has been able to contribute to changing the way key stakeholders view forests, shifting the profile of the sector from one perceived primarily as a net cost to one that can potentially be self-sustaining and provide economic value. In Burkina Faso, the impact of FIP on government commitment to sustainable forestry has been strong, with FIP being a key driver in supporting the national REDD+ strategy. In Mexico, the forestry authority, CONAFOR, has successfully coordinated a wide-reaching program of forestry interventions, and FIP funding has contributed to a shift in thinking toward the increased feasibility of extending credit to forest enterprises (as opposed to a wholly subsidy-driven approach).
38. The innovative DGM is empowering forest-dependent indigenous peoples and local communities to set priorities and design and implement community-led projects aimed at sustainably managing forests and ending poverty and inequality. Not only is DGM providing these communities with a platform to engage more powerfully on issues that impact their livelihood, such as land rights, it is also highlighting the importance of indigenous voices and perspectives in finding solutions to climate change at a global level.

39. According to an independent learning review of DGM⁸, the mechanism is resulting in sub-projects that deliver outcomes efficiently, better meet community needs, have better inclusion of marginalized groups, and have better constituent representation, among other outcomes. Beyond these important tangible benefits, the learning review highlighted that trust, ownership, and transparency were essential contributing factors to DGM's success. Most importantly, this enhanced trust also has improved and deepened relationship between and the World Bank, governments, and even among organizations of indigenous peoples and local communities.

4 Impact of CIF: the role of its business model

40. CIF works to achieve its objectives through a business model based on a programmatic approach as its primary model of delivery. Such an approach, implemented through multiple MDBs, has several notable features at both the strategic planning and project implementation phases.

41. At the strategic planning phase, the programmatic approach encompasses the development of country-led investment plans through a consultative process that is country-driven. MDBs, country governments, and other stakeholders, including the private sector and other development finance institutions, work together to assess challenges and opportunities and agree on key investments that could bring about higher catalytic effect with available resources. It includes inter-ministerial coordination within countries and policy dialogue at the highest levels with the aim to enhance national impacts of climate investment by aligning with national priorities.

42. An essential feature of this approach is a scaled up, predictable, and flexible resource envelope, which permits the development of strategically linked investments unified by a transformative vision that helps to incentivize high-level engagement within governments and sector ministries. It is also supported by various upstream activities (e.g., policy reform, technical assistance, institutional strengthening, analysis, awareness raising), and gender and social inclusion across countries' programs through intensive local stakeholder engagement.

43. At the project implementation phase, the CIF business model leverages a flexible, adaptable approach that allows for real-time learning to adapt to changing contexts and capitalize on emerging opportunities. This includes flexibility to reallocate investments to projects that offer the greatest transformational potential and dedicated private sector programs to leverage real-time market opportunities. The CIF business model also includes results measurement through multi-stakeholder monitoring and reporting, providing an opportunity to regularly convene stakeholders across sectors and ministries and sustain dialogue to support the climate change and mainstreaming agendas. Ongoing coordination and knowledge and learning efforts within country programs and across regions or technologically-linked themes enhance cross-learning and synergies among projects and programs.

⁸ Learning Review of the Dedicated Grant Mechanism for Indigenous Peoples and Local Communities (DGM)

4.1 Unique features and advantages of CIF business model

44. **CIF's model is unique among climate funds.** Adopting this approach has proven to have significant advantages over a project-by-project approach. CIF has contributed to shifting development trajectories in target countries and all CIF programs have demonstrated evidence of transformational change. The approach has led to high levels of efficiency in the delivery of climate finance, unparalleled by any other climate fund in the architecture. Results from the use of the programmatic approach have been corroborated by independent evaluations of the CIF's programmatic approach⁹ and CIF's contribution to transformational change.
45. **CIF's country-led model sets the stage for multi-sectoral, context specific transformation** that aligns with national priorities and ambitions on sustainable development. CIF's programmatic approach results in the development of strategically linked investments and activities that take a wider systems perspective to investments rather than a piecemeal or project by project view. This allows for better aligning with national strategies and priorities through a participatory process in which multiple stakeholders are consulted to identify investments that ensure synergies across ministries.
46. **MDB coordination and delivery of finance contributes to large-scale, coherent intervention packages that help move markets.** CIF is the only multilateral climate fund to work with MDBs exclusively and collectively, bringing multiple banks together for coordinated action at both national and global levels. CIF recipient countries benefit from these banks' varied skillsets and ability to leverage financing, mobilize other actors, and provide broader policy support. Through the coordination mechanism of CIF's partnership approach, MDBs, together with country governments, have targeted multiple barriers to climate investment and have contributed to transformational change, especially through enhancing the scale of investments and supporting national strategies.
47. **The scale, concessionality, and predictability of CIF** financing incentivize high-level actors to engage in strategic dialogue and increase the potential for systems-level investments at the scale required to influence deep and lasting change. This, in turn, has a strong influence on the types of projects that CIF can advance and encourages MDBs and countries to pursue new and riskier first-of-its kind low-carbon and climate resilience projects with innovative features.
48. Further, **flexibility of CIF resources** strongly influences the types of projects that CIF can support, accelerating progress towards low-carbon technologies. The range of investment tools available under CIF—concessional loans, equity, local currency financing, guarantees—and flexibility of application provide client countries and MDBs with the **risk-bearing financing required to push boundaries** in sectors and projects. The long tenor of resources allows for flexible structuring and enhances blending opportunities, making project finance costs more acceptable to recipient country governments. Over the past 10 years, these resources have been instrumental in allowing MDBs to enter new markets and grow new low-carbon segments of business, helping countries

⁹ Evaluation of the Climate Investment Funds' programmatic approach. August 2018

accelerate towards reaching their nationally determined contributions (NDCs) while attracting billions of dollars in private sector investment.

49. The flexibility of CIF funding during implementation **enables learning by doing and course correction**, adapting investments to changing contexts to leverage emerging opportunities. This flexibility enables recipient countries to reallocate resources as needed in response to changing country circumstances. For example, if a project concept becomes less relevant after investment plan endorsement due to evolving market dynamics, resources can be reassigned towards more strategic opportunities with enhanced transformational potential. Dedicated private sector programs also enable new resources for targeted private sector investment based on new and emerging market opportunities.
50. Coordinated monitoring and reporting (M&R) and **focus on knowledge and learning enhances the overall impact of the CIF model**. Through the programmatic approach, country programming budget is made available for knowledge and learning activities. In many instances, knowledge and learning is also supported through the programmatic M&R process—bringing stakeholders together to discuss progress and lessons learned—as well as by country level focal points whose responsibilities include capturing and discussing lessons learned from the implementation of projects. Dedicated learning and exchange forums (e.g., SCF pilot country meetings, PPCR regional dialogues, and thematic learning events) also allow for formal and informal information exchange and dialogue among country partners on their sector and CIF experiences, and contribute to building capacity and knowledge networks among key country officials and experts.
51. **The CIF model supports social inclusion**, including improved gender mainstreaming; advancing women’s voice, skills, and livelihoods; and giving voice to indigenous peoples and local communities and others in decision making. CIF investment plans and projects increasingly include in-depth gender analysis, women-specific activities, and sex-disaggregated monitoring and reporting. There is evidence of systemic change regarding gender-responsive design and institutional changes, as well as market-related outcomes. Strong local stakeholder engagement processes and innovations such as FIP’s DGM help to ensure broad participation and buy-in from a range of stakeholder groups, a key ingredient in leveraging and sustaining positive systemic change.
52. **CIF’s business model has had a strong positive influence on MDB operations**. First, CIF made a recognized contribution to MDBs’ progress in mainstreaming climate change into their institutions and operations and to strengthen the links between the public and private sector institutions or windows. According to testimony from one MDB representative: “CIF has been unique in providing an opportunity to engage client countries and stakeholders in a long-term, ten-year-plus horizon discussion about sector-wide transformation to address climate change...We don't get this through regular project discussions.”
53. Second, CIF’s approach of piloting innovative instruments and concepts has helped MDBs develop and test new products and learn lessons later replicated with their own institutional resources, thus amplifying CIF’s transformational impact through the leveraging of initial CIF finance. Replication is especially supported when new products or strategies can be taken up by private

sector actors, and when the CIF project approach is closely aligned with the implementing unit's core investment business.

54. For example, in Colombia, an innovative energy savings insurance scheme was piloted with CTF financing by IDB's Capital Markets and Financial Institutions Division. Based on its success, IDB is now replicating the scheme with its own funding in nine other Latin America and Caribbean countries. In EBRD, CTF support helped evolve financial intermediary products. CTF and gender support also helped EBRD develop a gender toolkit on district heating based on research results. EBRD has since mainstreamed these research results in its own processes for municipal finance teams, thus expanding the reach of its gender and inclusion team. AfDB used FIP concessional resources in Ghana to pilot its first public-private partnership project in the forest sector. AfDB is now undertaking subsequent work to understand barriers and risks for investors and to design a fund for debt or equity support to commercial forestry plantations in Africa. In the World Bank Group, CIF funds helped mainstream climate change by opening new opportunities for discussions with clients, financing preparatory work, and providing concessional funding to enable projects to move forward. In IFC, CIF contributed to the development of new blended finance approaches.
55. Third, the CIF business model creates a collaborative platform for MDBs to work and learn together at the global level, with spillover effects to other joint initiatives. MDB CIF focal points cooperate closely and in practice, this global cooperation supports other joint IFI initiatives, such as on climate finance tracking undertaken by MDBs for regular reporting.

4.2 Implementing CIF business model: Country examples

56. These features have worked holistically to bring about transformational change, as illustrated and evidenced in the following country examples. While each feature of the business model has advantages, it is their melding—country-led investment plans accompanied by scaled-up, concessional, predictable finance, and flexibility in implementation—that fully leads to the transformative outcomes witnessed through CIF investments.
57. In **Zambia**, the programmatic, country-led approach helped mainstream climate resilience into national development plans. It provided a convening platform for a broad range of stakeholders from cross-sectoral government ministries, non-government actors, including civil society groups and highly affected communities and the private sector, to identify priority projects that would support the implementation of its climate resilience program. Taking advantage of the crucial value of this consultative and participatory approach, as compared to a project-by-project approach, the government mainstreamed adaptation and resilience objectives in its Sixth National Development Plan. This ensured that programs and projects were designed and implemented with inter-ministerial consultations that took into account climate risks across sectors.
58. Furthermore, under the leadership of the Ministry of Finance and National Planning, the government established a Climate Change Secretariat with the primary responsibility of coordinating all government efforts to address climate change. Learning from the experience of implementing the programmatic approach, adaptation and disaster risk management principles were integrated into priority programs in agriculture, fisheries, transport and other infrastructure

sectors and even in local and community development plans. Further, government agencies allocated staff and budgetary resources for climate resilience programs to ensure sustainability of the government's adaptation mainstreaming efforts.

59. At the local level, the close coordination between national and local agencies during the planning phase enabled smooth implementation of community-based adaptation interventions. It also gave an opportunity to communities to make their own decisions on the types of livelihood projects they could sustainably manage and that would improve their resilience to climate change. The experience and lessons from these communities has inspired other communities to do similar projects.
60. This momentum of national mainstreaming was sustained during the development of the Seventh National Development Plan (2016–20). This plan integrates climate change considerations across all sectors and strategies; and adopts a programmatic approach to development planning and investments. National guidance was recently issued that all provinces and districts must align their efforts with strategies in this plan. Accordingly, all provincial and district development plans across the country are required to mainstream climate change and prepare actionable programs to reduce climate risks. Furthermore, positives outcomes and impacts of the PPCR Zambia program enabled the government to access additional funding from the Green Climate Fund (GCF) to expand community-based adaptation approaches in other parts of the country.
61. In **Morocco**, CTF has been instrumental in supporting government's commitment to diversifying its energy mix and transitioning toward a sustainable energy future. The Moroccan government has set ambitious targets of boosting the share of electricity generation from renewables to 42 percent in 2020 and 52 percent in 2030. Through a country investment plan and a regional program, CTF has committed USD 685 million to support Morocco's energy transition through investments energy efficiency, wind, and, most notably, CSP. Through these investments, CTF has brought the MDBs, namely the World Bank and AfDB, together to collaborate and lend to these projects.
62. For CSP projects alone, CTF has provided USD 535 million highly concessional loans to Morocco, including SUD 485 million for Noor-Ouarzazate and USD 50 million for Noor-Midelt, to build the world's largest solar complex of its kind. Access to a large, flexible, and predictable resource envelope has been important to enable the government to bring a larger number of investors on board to support this CSP development. The scale of CIF finance has been a significant driver of systemic change, catalyzing investor interest and changing perceptions of risk toward investing in the technology. This has supported the mobilization of bilateral and multilateral financial institutions, such as AfD, KfW, and EIB, as well as commercial banks to co-finance the CSP projects in Morocco. CTF has helped bring down the high financing costs for these projects and boost the confidence of the investors in CSP technologies.
63. Large-scale CSP investments in Morocco have contributed to lowering costs within Morocco and elsewhere. Independent analysis concludes that the low-cost debt provided by CTF helped drive down the cost of CSP in Morocco by 20-30% percent for Noor I and an additional 12-15% percent

for Noor II and III, thus reducing the government subsidy required to bridge the affordability gap for CSP¹⁰.

64. Significant learning by doing has also been achieved through CTF investments in CSP technologies, contributing to the global cost decline and CSP investments in other countries. ACWA Power, contracted to provide CSP for all three phases of the Moroccan tenders, has gone on to deliver more cost-efficient plants elsewhere in the region, spurring learning and replication. In 2017, ACWA Power, with Shanghai Electric, were contracted to provide 700 MW of CSP in Dubai for USD 3.9 billion with a winning bid of USD 0.073/kWh—significantly lower than costs for Morocco. ACWA indicated that they had achieved significant learning from their participation in Morocco Noor I and particularly Noor II+III. This learning centered on procurement, supply-chain management, engineering design, and plant optimization. The Dubai plant has set a global benchmark for CSP costs.
65. In Turkey, in the early 2000s, a rapidly expanding economy and a rising urban population led to fast-growing energy demand and increasing dependence on energy imports (around 6 percent of GDP in 2008). This made energy independence, through both renewable energy and energy efficiency, not just an environmental priority but a fiscal one too. Even though widespread energy efficiency deployments could alleviate its energy security concerns while boosting economic competitiveness, by the late 2000s, the lack of local financing options was restricting energy efficiency market growth.
66. Turkish financial institutions historically had been reluctant to offer energy efficiency financing product lines due to perceived higher transaction costs and risk. Moreover, institutions typically had limited internal capacity to properly assess, develop, and market financing instruments for such projects. At the same time, high upfront costs for energy efficiency equipment made commercial and industrial companies, especially small and medium-sized enterprises (SMEs), hesitant to purchase such equipment outright, and a lack of information about the operational and cost benefits of energy efficient operations suppressed customer demand for energy efficiency financing.
67. The CIF joint MDB planning process to leverage different institutional strengths helped Turkey to design a mix of public and private investments that are being used effectively to leverage national commitments to scale energy efficiency programs through different business models. This is scaling up finance to SMEs, improving market positions for financial intermediaries, and transitioning toward commercial terms. The joint convening power and synergistic public and private investments of the World Bank, IFC, and EBRD helped enable government and banks to move forward with sustainable energy finance for SMEs. Momentum gained through the programmatic planning process, along with the certainty and flexibility of the large CTF resource envelope, helped facilitated these innovative, first-of-a-kind projects.

¹⁰ Bloomberg New Energy Finance, 2019

68. Financing delivered through World Bank, IFC, and EBRD helped local banks develop viable business models, with an initial CTF loan of USD 50 million eventually leveraging over USD 2 billion in additional finance.
69. Together with investment financing, technical assistance was also offered to the partner banks in the early stages of the program to build awareness and capacity in the market. This included support for public awareness campaigns to build a recognizable brand; staff training to identify, evaluate, and process sustainable energy projects; and project monitoring and structuring among other support. Without this assistance, it is hard to predict if the partner banks would have been able to attract clients and identify and evaluate projects that were technically feasible.
70. Many of these markets are now considered to be fully commercial without the need for continued concessional finance. Initial investments have spurred follow-on credit lines from participating banks and leasing companies on fully commercial terms. For example, Akbank disbursed all initial funding and obtained an additional USD 25 million to finance its remaining pipeline. Yapi Kredi Leasing also sought an additional USD 96 million loan. EBRD created a third iteration of the credit line with total financing of USD 942 million—none of it concessional finance except for a technical assistance package—and enough scale to justify the creation of two separate credit lines focused on the residential and industrial sectors. Businesses are also thriving, with one leasing company turning a USD 25 million CTF loan into an energy efficiency lending portfolio of over USD 750 million.

4.3 Applicability of CIF business model in broader context

71. Most of the advantages described in the above section transcend the sector in which they occurred. The CIF programmatic approach leads to benefits irrespective of sector and country-context. It offers an inclusive and sequenced way to prioritize investments, serves as a unique and valuable platform for formal MDB cooperation, and provides the certainty of available scaled-up resources. Across all programs and across multiple sectors this approach has led to increased ownership, awareness, and willingness by countries to engage in dialogue around climate action in the context of larger development strategies. Given the wide diversity of country circumstances in CIF pilot countries, the flexibility of the programmatic approach is an asset, with models ranging from nesting in stand-alone national programs on climate to initiating cross-sectoral discussions and national and regional dialogue.
72. For example, when climate adaptation efforts were just emerging in PPCR countries, the programmatic approach helped establish a common multi-sectoral vision for climate resilience that aligned with national development priorities. Similarly, the programmatic approach has helped FIP countries generate more cross-sectoral linkages on the key drivers of deforestation in forest-related sectors, such as transport, mining, and agriculture, and has enabled a participatory process in support of national REDD+ efforts that fostered trust and partnership building among diverse constituencies, including indigenous peoples groups and private sector. The programmatic approach has led to effective consultation processes and has offered a platform and voice for

responsible line ministries in forestry to convene inter-sectoral and inter-ministerial dialogue within government in ways that were not possible before FIP involvement.

73. In low income SREP, PPCR, and FIP countries, CIF's combination of technical assistance with investments has helped support first-mover projects and institutional capacity strengthening that MDBs or countries may not have prioritized for funding otherwise. In middle-income countries and more advanced markets, the certainty of available scaled-up resources has helped facilitate the design of more innovative, well-aligned projects aimed at transformational change and benefitting from joint-MDB planning. Both low and middle-income countries have benefited from CIF opportunities for deep learning and knowledge exchange on key technology or sector-based issues, such as CSP, mini-grids, and resilience.

5 Challenges ahead: Identifying climate action gaps on the horizon

74. The application of the CIF business model over the last 10 years has proven to be conducive to transformational change across many countries, regions, and sectors. It is important now to think about how it can be applied to help address major challenges with the speed and scale needed. Six challenge areas have been identified and are present below. These are: adaptation and resilience, forestry and sustainable landscapes, energy transition and energy access in low income countries, cooling, transport and urbanization.

5.1 RESILIENCE: Accelerate expanded resilience planning and investment by countries

75. Climate change poses a grave and increasing threat to developing countries while they continue to pursue economic growth and poverty reduction. The Global Climate Risk Index 2018 identified that eight of the 10 most vulnerable countries are from the developing countries. While the call for action to reduce GHG emission has become more urgent, as emphasized in the IPCC Special Report¹¹, the impacts of climate change will continue to develop and intensify. Developing countries need to act quickly to avoid the devastating consequences climate change may bring. From now until 2030, climate policies will have negligible effects in altering the amount of global warming that will take place. Even 1.5°C of global warming is unavoidable and will require “unprecedented” socio- economic transformation, and higher ambitions to prepare for climate change impacts¹².
76. To achieve transformation and assist developing countries to achieve a climate-resilient development pathway, significant financing resources are required to implement adaptation actions. The countries that are most vulnerable to climate change are also those with very limited resources to invest in resilience. Channeling significant resources to these countries becomes crucial to contribute to closing the adaptation finance gap. It will be important for these countries to have access to a diversified portfolio of financial instruments to invest in adaptation and reduce their exposure to climate risks. In 2015 and 2016, the total annual adaptation finance only

¹¹ http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf

¹² See Footnote 1.

amounted to USD 22 billion out of the USD 410 billion climate finance annual average for two years¹³. According to the UN Environment Programme (UNEP), adaptation finance requirement could range from USD 140 billion to 300 billion by 2030; and from USD 280 billion to 500 billion by 2050¹⁴. Compared to actual adaptation finance, these projections indicate an enormous finance gap.

77. Given the limited financial resources and borrowing capacity of developing countries, access to concessional sources of climate finance is critical to encourage them to invest in adaptation at scale and allow transformative changes that are normally not prioritized in a budget constrained environment. Also, the private sector can play an important role in closing the adaptation finance gap and in building long-term resilience. However, adaptation remains largely a challenging area for the private sector, particularly in developing countries considering the “limited capacity, knowledge gaps, financing constraints and the risk/return profiles of the private sector”¹⁵. The availability of and access to concessional finance provides a window of opportunity for the private sector to overcome barriers, test out new business models, and take on climate adaptation projects at scale in developing countries.
78. Countries worldwide clearly recognize the urgency to avoid the irreversible consequences of climate change. Through their NDCs, countries have outlined their commitment to contribute to global GHG emission reduction and their adaptation priorities. However, the NDC targets of developing countries are mostly conditional commitments requiring additional financing and technical support to achieve them. Also, most of these NDCs will need resources and assistance to further translate adaptation commitments into concrete programs and actions.

5.2 SUSTAINABLE LANDSCAPES: Supporting the forest-agriculture interface

79. According to the UN Food and Agriculture Organization (FAO), forests have four major roles in climate change:
 - a) Forests currently contribute about to one-fifth of global carbon emissions when cleared, overused or degraded.
 - b) Forests react sensitively to a changing climate.
 - c) When managed sustainably, forests produce wood fuels as a benign alternative to fossil fuels.
 - d) Forests have the potential to absorb about one-tenth of global carbon emissions projected for the first half of this century into their biomass, soils, and products and store them, in principle, in perpetuity.
80. Up to 2.5 billion people, including more than 370 million indigenous peoples and local communities, rely on land, natural resources and ecosystems that are held, used, or managed

¹³ <https://climatepolicyinitiative.org/wp-content/uploads/2017/10/2017-Global-Landscape-of-Climate-Finance.pdf>

¹⁴The 2016 Adaptation Finance Gap report of UNEP. <https://bit.ly/2SWG80z>

¹⁵ Vivid Economics 2016. Private Sector Investment in Climate Adaptation in Developing Countries. Landscape, Lessons Learned and Future Opportunities. https://www.climateinvestmentfunds.org/sites/cif_enc/files/7544-wb_cif_ppcr_report-v5.pdf

collectively. Some of the most ecologically important and carbon -rich places in the world are intact because of the environmental stewardship and traditional knowledge of indigenous peoples and local communities. They are, therefore, key partners for implementing sound environmental and climate change policies that contribute to their well-being and livelihoods.

81. Globally, forest cover is estimated at 4 billion ha, down from pre-industrial forest cover of 6 billion ha. Despite decreased deforestation rates in some regions, currently forest loss in the tropics continues to increase at an unsustainable rate (approximately 16 million ha of tree cover loss in 2017)¹⁶. Forests are under significant threat as increasing demands for food, fiber, fuel, and minerals often drive large-scale land use changes at the cost of forest and tree cover. Agricultural expansion has been identified as the primary driver of between 53 and 80 percent of global deforestation. While three major agricultural value chains - beef, soy, and palm oil account for 36 percent of tropical deforestation¹⁷, a recent World Bank study demonstrates that agricultural value chains can play a significant, positive role in protecting and enhancing tropical tree cover¹⁸.
82. Forestry and agriculture lie at the nexus of two central challenges for sustainable development: food security for the Earth's anticipated 9 billion people, which will require an increase of global agricultural production of 60 percent by 2050, and the role of land use in addressing climate change. The drivers of forest loss and forest degradation are deeply rooted in governance and market problems that cannot be solved by thinking about forests in isolation; rather, a comprehensive landscape approach is necessary. This approach needs to take into account the linkages between forest ecosystem services and agricultural productivity and bring them into decision-making processes.
83. To ensure food security and reduce emissions, current land use strategies and agricultural practices must change. There is a need to consider the food system in its entirety, not only focusing on increased productivity, but also on inefficiencies in agricultural production, post-harvest and storage, processing, distribution, and consumption causing food loss and waste (FLW), which itself generates a full 8 percent of annual global greenhouse gas emissions.
84. A long-term landscape approach will also need to tackle the specific challenges that are prevalent in sustainable forest management to minimize the deforestation that future demands of forest products could cause (for example, world demand for timber is expected to quadruple by 2050)¹⁹. These challenges include, among others, weak community involvement in decision-making processes related to the use of forests, low investments in planted forests, lack of access to finance for forest-related enterprises, perceptions of high risk by the private sector, and inadequate forest governance to foster responsible investments and combat illegal logging.
85. As highlighted by more than 80 countries in their NDC, forests and land use are an integral part of the solution to climate change, contributing to both the mitigation and the adaptation agendas. The barriers in both public and private sectors for investing in sustainable landscapes, are

¹⁶ WRI, Global Forest Watch

¹⁷ www.tfa2020.org/wpcontent/uploads/2017/12/TFA2020_CommoditiesandForestsAgenda2020_Sept2017.pdf

¹⁸ www.profor.info/knowledge/leveraging-agricultural-value-chains-enhance-tropical-tree-cover-and-slow-deforestation

¹⁹ World Bank Forest Action Plan.

considerable, but not insurmountable. Concessional finance—if properly structured—can help address these barriers, both by enabling individual deals and projects to go to scale and by supporting the necessary governance improvements.

5.3 ENERGY TRANSITION AND ENERGY ACCESS: Significant achievements but work remains

86. The past decade has witnessed unprecedented progress at a global scale in the deployment of renewable energy technologies and in the expansion of electricity access. With rapid cost reduction, renewable energy technologies, particularly and solar PV, have increasingly become a least-cost option for power generation and for extending electricity access in many developing countries. By the end of 2017, solar PV alone had exceeded 400 GW gigawatts worldwide, which is more than the total electricity generating capacity in India. Access to electricity has also expanded in most developing countries. In Sub-Saharan Africa, for example, the percentage of population having access to electricity increased from 15 percent in 1990 to 26 percent in 2000 to 43 percent in 2016.
87. Despite the progress made in energy transition and energy access, many challenges remain for the emerging economies to shift to a sustainable, low-carbon energy system and for many developing countries, especially in Sub-Saharan Africa, to achieve universal energy access. There is growing consensus that a thorough transformation of the energy system is essential for reaching the long-term goals of the Paris Agreement. Energy access, for its part, is central within the UN Sustainable Development Goals (SDGs), encapsulated by SDG7, which seeks to “ensure access to affordable, reliable, sustainable, and modern energy for all.”

5.3.1 Challenge for global energy transition

88. According to the International Energy Agency (IEA)²⁰, limiting the global mean temperature rise to below 2°C would require an energy transition of exceptional scope, depth, and speed. Energy-related CO₂ emissions would need to peak before 2020 and fall by more than 70 percent from today’s levels by 2050. The share of fossil fuels in primary energy demand would need to halve between 2014 and 2050, while the share of low-carbon sources, including renewables, would have to more than triple worldwide to comprise 70 percent of energy demand in 2050. Energy intensity of the global economy must be reduced by 2.5 percent a year, while wind and solar combined must become the largest source of electricity by 2030. This would need to be accompanied by a major effort to redesign electricity markets to integrate large shares of variable renewables, alongside rules and technologies to ensure flexibility.
89. While deployment of renewable energy such as solar and wind has seen a dramatic expansion in recent years due to sharply falling costs and supportive policies, the inherent variability of such technologies raises new challenges for power systems operators and regulators. The integration of higher shares of variable renewable energy involves technical, economic, and institutional factors, related to not only the attributes of generation but also to the complex nature of the energy sector more generally. Most developing countries need to improve grid integration of

²⁰ IEA, *Perspectives for the Energy Transition*, 2017.

variable renewable energy overall to be able to further expand solar PV and wind technology deployment.

90. The high penetration of VRE requires increasing the flexibility of the grid. This can be achieved by energy storage - including batteries and pumped storage; by increasing the generation capacity of existing hydropower dams; by managing hour-to-hour demand (e.g. through smart grid technologies); or by strengthening regional integration. Renewable energy technologies that are less subject to variability, such as CSP with thermal storage, geothermal, and bioenergy, may also have a role to play. A high penetration of renewable energy in electricity grids with prices based on marginal costs may also increase price volatility, undermining the incorporation of further RE capacity. Policy instruments and financial instruments may be used to address such volatility
91. One of the most promising grid flexibility technologies is battery energy storage. It can help advance countries toward a low-carbon future and support flexible and resilient electricity grids that provide reliable power. Battery storage can displace fossil-fuel generation by increasing the utilization of large-scale renewable capacity. Battery storage technologies may be competitive or near-competitive in today's energy systems in some cases. However, regulatory and market conditions are frequently ill-equipped to compensate storage for the suite of services that it can provide. Furthermore, some storage technologies are still too expensive relative to other competing technologies. Additional policy and financial support is needed to scale up the deployment of a wide range of storage technologies to meet both the climate and the SDG goals.

5.3.2 Challenge for universal energy access

92. Energy access remains a key development constraint worldwide, despite significant progress in supplying electricity to the world's poor during the past three decades. Currently, one billion people worldwide still live without electricity, while almost 3 billion people do not have access to clean fuels for cooking and heating. With the adoption of the SDGs in 2015, the global community recognized energy access as an essential element for sustainable development and called for universal energy access by 2030.
93. Meeting the SDG7 targets on energy access is a daunting challenge. According to IEA estimates, without accelerated progress, there will still be 674 million people worldwide living without electricity by 2030 and the gap for access to clean cooking fuels and technologies will be even higher. Sub-Saharan Africa and South Asia continue to have the largest electricity access deficit. The rural-urban divide in access remains wide, with almost 87 percent of the world's population living without electricity located in rural areas. Rural electrification is key for the socio-economic development of rural areas in developing countries. Improving energy access can trigger economic development and lead to increases in income generation for the poor.
94. Compared with electricity access, clean cooking has not received much attention from policymakers and investors, and progress for deploying clean cooking fuels and technologies lags considerably behind. There have been significant constraints to more widespread dissemination of clean cooking solutions, including high entry costs to the technology for users, lack of awareness

of clean cookstove benefits, financing gaps for both producers and consumers, and slow progress in cookstove model innovation.

5.4 COOLING: Technologies for health, production, and quality of life in a changing climate

95. There is a Janus-faced challenge in providing affordable, adequate cooling in developing countries. While cooling is essential for sustainable development and livelihood improvement, the impact of increasing cooling demand has profound implications for global climate change.
96. As temperatures reach new records and extreme heat stress is on the rise due to climate impacts, the health and economic risks associated with lack of access to sustainable cooling is higher than ever, especially for the most vulnerable groups of people in the developing world. Millions die each year due to lack of cooling that could help address hunger and malnutrition, preserve the efficacy of vaccines, and alleviate the worst health impacts of deadly heat waves. Lack of access to cooling also hinders farmers from increasing the sales value of their produce. Without proper refrigeration, produce spoils and farmers are obliged to sell immediately rather than wait for off-season markets when prices are higher and there are better opportunities to raise their incomes.
97. Globally over 1.1 billion people lack access to cooling, with most living in Asia and Africa²¹. They include approximately 470 million rural poor living in extreme poverty and without access to electricity, and approximately 630 million urban poor who live in slums and lack access to quality housing and adequate cooling options. Global demand for cooling, especially space cooling, and the associated energy needs will grow rapidly in decades to come. Of the 2.8 billion people living in the hottest parts of the world, only 8 percent currently have air conditioners, compared with 90 percent in the United States and Japan. According to the IEA, cooling by air conditioners and electric fans accounts for about a fifth of total electricity used in buildings around the world, which amounts to 10 percent of global electricity consumption²². As developing world households become more affluent, the demand for air conditioners, as well as refrigerators, is set to soar and become the main driving force for electricity demand for buildings.
98. Supplying power to meet expected exponential cooling demand comes with both large costs and adverse impacts on the global environment. There is growing consensus that we need to find solutions to provide cooling without further heating the planet. Efficiency improvements and the use of climate-friendly refrigerants have the potential to cut the energy growth as well as GHG emissions through such supply-side measures as mandatory energy performance and refrigerant standards, labeling, and investments in more efficient and climate-friendly technologies. According to the IEA, making cooling more efficient would also make it more affordable, more secure, and more sustainable, while saving as much as USD 2.9 trillion in investment, fuel, and operating costs.
99. In addition to policy and regulatory measures, there are a variety of other barriers that often hamper efforts to adopt efficient cooling policy and technologies. These include lack of finance and financial incentives, poor consumer awareness leading to weak demand for energy efficient

²¹ SEforALL, *Chilling Prospects: Sustainable Cooling for All*, 2018.

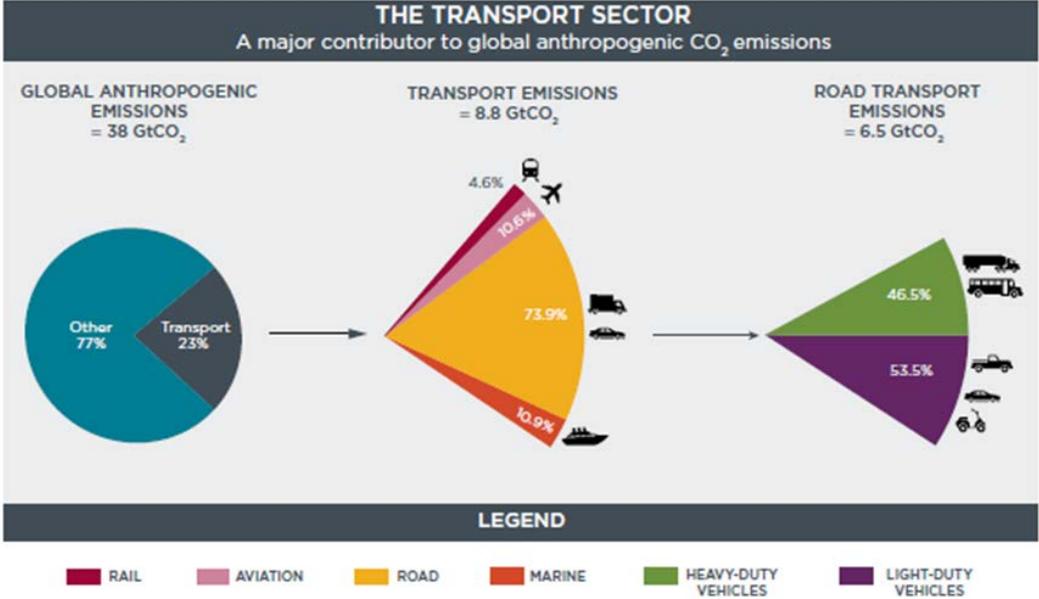
²² IEA, *The Future of Cooling*, 2018.

technologies, and lack of product availability. In the short term, there are many ways to reduce heat buildup in building through measures, such as cool roofs and pavements and selecting materials and colors to reduce the albedo light reflection of buildings and city streets. As roofs and pavements typically cover about 60 percent of city surfaces, the use of reflective materials can substantially reduce urban heat island effects that will increasingly affect large numbers of persons in cities around the world. Another promising alternative technology is district cooling, which can provide large energy savings at scale in urban areas.

5.5 TRANSPORT: Revolution still required for sustainable mobility

- 100. The world is transforming rapidly, changing the way people and goods travel within and across cities, regions, and countries. By 2030, annual passenger traffic will exceed 80 trillion passenger-kilometers—a 50 percent increase; global freight volumes will grow by 70 percent; and an additional 1.2 billion cars will be on the road by 2050—double today’s total²³. Transport infrastructure and services will have an ever-greater role to play in meeting this additional demand.
- 101. Despite transport’s undeniable contribution to the world development, and improved lifestyles in several regions, today’s mobility is associated with intense fossil fuel use, large emissions of GHG emissions, and air and noise pollution²⁴ (see Figure 7).

Figure 7: Transport sector CO₂ emissions overview



102. In 2012, transport was the largest energy-consuming sector in 40 percent of the countries worldwide, and in the remaining countries, it was the second largest energy-consuming sector. By 2035, transport is expected to be the largest GHG emitter, accounting for 46 percent of global

²³ <https://www.weforum.org/agenda/2016/04/the-number-of-cars-worldwide-is-set-to-double-by-2040>
²⁴ See [Global Mobility Report 2017](#), Sustainable Mobility for All.

emissions. By 2050, it is expected to account for 80 percent of all global emissions²⁵. A reduction in transport-related GHG emissions will only be made possible by reducing transport's dependency on fossil fuels and increasing its reliance on alternative energy technologies. With 96 percent of global transport's energy mix currently dependent on fossil fuels, this is more easily said than done.

103. Governments and operators are increasingly looking into the potential of renewable energy options such as solar, wind, and bioenergy to power transport systems. While bioenergy use in transport has yet to take off, the IEA projects that the share of biofuels in the global transport energy mix will grow to 27 percent by 2050. Dissemination of electric vehicles and buses, for example, could have a direct impact on the reduction of pollutants generated by the internal combustion engine (ICE) vehicles. Their impact on GHG will depend on the sources of the energy consumed and will only become relevant if the weight of renewable energy sources in the energy mix of the grid is significant.
104. The transport sector is also highly vulnerable to the effects of climate change²⁶. Damage to transport systems can comprise a large share of the destruction caused by climatic events, while connectivity losses from disrupted transport can exacerbate the losses they inflict. These impacts may fall most heavily on vulnerable populations, particularly in areas where the availability of alternative routes or other transport options is poor. Resilient transport interventions and policies can significantly reduce future losses in assets and well-being. In many countries, spending on transport infrastructure maintenance can prevent damage caused by frequent floods and storms, and thereby reduce user costs and repair needs. The incorporation of resiliency from the planning stage onward is highly profitable, as every USD 1 invested in resiliency reduces losses by up to USD 4, while safeguarding food security and other social objectives of transportation²⁷.
105. Transformation of the global mobility system is urgently required to meet the Paris Climate targets, to increase its resilience, and to cut its environmental footprint. As a key financier for development, MDBs play a prominent role by bringing more financing toward the right kind of mobility projects. Given their experience, expertise, and existing country-level engagements, MDBs can play a critical role in supporting a bold transformation of the mobility system for climate action by leveraging private and national public capital to establish truly sustainable mobility solutions. The scale of change required will necessitate the following:
 - a) Transforming the dialogue with countries on transport and mobility to demonstrate the imperative of action
 - b) Financing projects at scale that are truly contributing to this transformation, in partnership with governments and the private sector
 - c) Coordinating efforts and action among MDBs to optimize impact

²⁵ See <https://www.adb.org/sectors/transport/key-priorities/climate-change>

²⁶ See "Moving towards climate-resilient transport systems" (2017)

²⁷ UNDP. 2011. *Catalyzing Climate Finance. A Guidebook on Policy and Financing Options to Support Green, Low-Emission and Climate-Resilient Development*. New York: UNDP.

106. The CIF business model, with a strong emphasis on programmatic approach, provides a platform to bring together all key stakeholders, including government, regional MDBs, private sector, among others, in a coordinated manner to identify potential activities in the sector in accordance with national/ regional priorities. This approach not only leads to the critical buy-in which ensures effective delivery of results on the ground but also the most efficient utilization of public and private co-financing.
107. The costs to support transition to sustainable, climate-proofed forms of mobility through use of new technologies are high and will require financing at scale and flexible approach. With the buy-in already achieved, CIF's offer of long-term, risk-appropriate financing, can have maximum impact through its support for both investments at scale and policy and technical assistance activities, depending on the local/regional demand.

5.6 URBANIZATION: Supporting climate-smart cities in a context of rapid urbanization

108. Unprecedented urbanization is transforming the world and the way we live. For the first time in history, more people live in cities than in rural areas. According to the UN, around 55 percent of the world's population live in urban areas and that share is expected to increase to 75 percent by 2050. An additional 2.5 billion people are projected to be added to the world's urban population by 2050 in the rapidly expanding cities and in new secondary cities, with almost 90 percent of this growth happening in Asia and Africa. By 2050, the share of urban population is projected to reach 56 percent in Africa and 65 percent in Asia.
109. A large share of urban growth in developing countries is unplanned and unstructured with significant economic, social, and environmental costs. Many cities in Sub-Saharan Africa, for example, have grown rapidly but without sufficient policy coordination, efficient planning, and adequate infrastructure and services. Cities are characterized as crowded with people and dwellings, disconnected due to a lack of transport and other critical infrastructure, and costly for both households and firms because of their inefficient spatial forms²⁸. Nearly two-thirds of the region's urban population live in areas classified as slums by UN Habitat, resulting in increasingly high levels of congestion, pollution, illness, disease, crime, and insecurity, as well as in a lower resilience to extreme climate events.
110. Rising sea levels, increased precipitation, inland and coastal flooding, more frequent and intense cyclones and storms, landslides, heat stress, drought, and water scarcity will all have significant adverse impacts on urban infrastructure systems and services, urban economies and populations, and on ecosystem services.²⁹ This is because most countries' vital economic and social infrastructure, government facilities, and hard assets are sited in cities. Climate change will negatively impact infrastructure and reduce access to basic urban services (e.g., safe drinking water, sanitation, drainage, and health and education services), and thus quality of life in cities. In fact, many major coastal cities are already under threat from climate change and seeing increased

²⁸ World Bank, 2017

²⁹ For example, between 1971 and 2009, South Asia experienced 1,107 natural disaster events that affected more than 2 billion people in total, causing over 800,000 deaths, and more than USD 80 billion in direct losses.

flooding and property damage. And the impacts of climate change will only be exacerbated in coming decades, with the expansion of urban settlement and land use in marginal areas and other areas of increasing vulnerability to extreme climate events³⁰.

111. With dense populations and a diverse range of emitting industries, activities and services, as well as being a locus of consumption of good and services by their residents, cities are the origin of considerable GHG emissions. Overall in 2013, 64 percent of global primary energy use originated in urban areas, resulting in GHG emissions of about 24GtCO₂³¹.
112. The emission scenarios in cities need not remain on their current trajectories. Rapidly urbanizing areas present a unique opportunity to plan, develop, build, and manage cities that are ecologically and economically sustainable, and should be prioritized. Rapidly urbanizing areas, especially small to medium-size cities in developing countries, where urban form and urban infrastructure are not yet locked in hold the largest mitigation opportunities with respect to human settlements and built infrastructure and systems³². It is urgent to act on these priority areas, given that approximately 55 percent of total urban land by 2030 will be built in three decades from 2000 to 2030 (split evenly between China/India, and the rest of Asia). Rapid urbanization in lower income countries is expected to contribute a full 90 percent of the projected increase in urban transport emissions, as well as to the negative impacts of traffic congestion, if automobile mobility continues to increase unabated.
113. Both the urgency of urban climate action and scale of infrastructure gap in the rapidly expanding cities and new secondary cities, create an opportunity for the MDBs, working in a coordinated way, to scale-up support to cities to achieve sustainable development patterns through climate-informed urban spatial planning and to support strategic public and private investments that translate plans to implementation.
114. Climate finance can be key to overcome the barriers facing the sector and help maximize climate action in cities by promoting programmatic city-level engagement as a useful complement to the national adaptation and mitigation policies. The CIF business model, and the programmatic approach that has been prioritized by CIF as its primary model of delivery, offers a suitable approach to help overcome barriers to mainstreaming climate considerations into strategic spatial planning and to demonstrate its transformational impacts in rapidly urbanizing areas.

6 Pathway ahead

115. The climate challenge is arguably more severe in 2019 than when the CIFs were first developed in 2008. At this critical juncture, a multitude of effective tools are likely necessary to help developing countries reach their climate mitigation and adaptation targets. The ten years of unique experience from the CIF have yielded important evidence and lessons about the CIF

³⁰ IPCC AR5, 2014

³¹ IEA, 2016

³² IPCC, AR5, 2014

business model's wider applicability to similar sectors or contexts. As described in this paper, the CIF business model and programmatic approach has been found to hold significant advantages over a project-by-project approach. At this point, it can be further explored how this model could help drive similar transformational change in other sectors, at a time when the need for concerted action at scale has never been clearer.