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# Analysis of barriers to crowding-in and maximizing the engagement of the private sector, including Private Sector Advisory Group recommendations

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## **Summary**

This paper outlines the barriers to private sector investment and engagement, and to capital mobilization, into climate mitigation and adaptation related sectors and projects in developing countries. Based on an analysis of barriers by sectors and countries, and supported by examples, the paper proposes general strategic elements for interventions by the Green Climate Fund's Private Sector Facility (PSF) where there is evidence of a market gap. The final part of the paper comprises recommendations to the Board from Private Sector Advisory Group (PSAG) on overcoming these barriers, based upon their discussion of the Secretariat's analysis.

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## I. Introduction

1. The Green Climate Fund's Board has requested the Secretariat to undertake an analysis of barriers to crowding-in and maximizing the engagement of the private sector to present to the Board no later than its fifteenth session, and has requested the Private Sector Advisory Group (PSAG) to present recommendations for consideration by the Board no later than its sixteenth session (decision B.13/05).
2. This paper outlines the barriers to private sector investment and engagement, and to capital mobilization, into climate mitigation and adaptation related sectors and projects in developing countries. Based on an analysis of barriers by sectors and countries, and supported by examples, the paper proposes general strategic elements for interventions by the Green Climate Fund's Private Sector Facility (PSF) where there is evidence of a market gap. The paper proposes a "building blocks" approach to tackle the complexity of the barriers in developing countries. The final part of the paper comprises recommendations to the Board from PSAG on overcoming these barriers, based upon their discussion of the Secretariat's analysis.
3. This paper acknowledges that public funding channelled through governments in support of private sector investment in climate mitigation and adaptation programs exists through provisions of loans, guarantees and grants, and through support aimed at creating an enabling environment for such investments. However, it is recognized that there is a significant market gap and an unmet demand for innovative approaches and financial instruments that could further overcome market barriers and mitigate risks.
4. Barriers to private sector investment are complex and intertwined. In this paper, we divide these barriers into five categories:
  - (a) Policy and regulatory barriers;
  - (b) Access to climate finance and local markets barriers;
  - (c) Affordability and technology barriers;
  - (d) Knowledge and education barriers; and
  - (e) Region and country-related barriers.

## II. Barriers to Private Sector Investment and Capital Mobilisation

5. An overview of global climate finance flows at the end of 2014 shows that private sector investments reached USD 241 billion, whilst public finance reached an average of USD 151 billion.<sup>1</sup> In the context of constrained public budgets, significant additional private sector finance will be required to reach the targets set in COP21, putting developing countries on low-carbon and climate-resilient development pathways.
6. It is estimated that developing countries will require USD 349 billion a year to implement their Nationally Determined Contributions (NDCs) for the next 15 years.<sup>2</sup> Against this backdrop, and given the limitations on public, bilateral, and multilateral funding sources, it becomes imperative for developing countries to consider how to attract and leverage different types of climate change investment, including from private and institutional investors.

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1 UNFCCC, "Biennial Assessment and Overview of Climate Finance Flows", January 2017. These numbers were based on an estimate by the Climate Policy Initiative, which was slightly conservative as per "Global Landscape of Climate Finance 2015, at: <http://climatepolicyinitiative.org/wp-content/uploads/2015/11/Global-Landscape-of-Climate-Finance-2015.pdf>. This is due to difficulty of tracking private investment volume and flows in developing countries.

2 Germanwatch, "Investing in Ambition: Analysis of the financial aspects in (Intended) Nationally Determined Contributions", May 2016.

7. Public financial flows into adaptation were estimated at about USD 25 billion in 2015, representing about 19 per cent of total USD128 billion climate finance into mitigation and adaptation injected by public finance sources into developing countries. This small amount of public sector adaptation investment has seen limited private sector involvement and little to no leverage of private sector finance<sup>3</sup>.

## 2.1 Policy and Regulatory Barriers

8. Policy related barriers are generally associated with:
- (a) The lack of an appropriate strategic and regulatory framework;
  - (b) Inconsistent policy support, such as shift of direction and interruption of regulatory incentives; and
  - (c) Lack of long-term commitment by government to support climate-related industries and market.

### 2.1.1 Lack of an Appropriate Strategic and Regulatory Framework

9. The absence of a comprehensive and adequate policy and regulatory framework for mitigation and adaptation on a national level that addresses both the demand and supply sides is a major deficiency and a risk source for private sector investments in a given country. Examples of inadequate policy and regulatory framework include:

- (a) A monopoly of one public utility company, making it difficult for small producers to sell and distribute to a third party, or even to the public utility company itself unless under ad-hoc circumstances lacking consistency and a transparent platform;
- (b) Independent and small power producers (IPP) lack a legal framework. Legal support is often granted on ad-hoc basis and generally not advertised in a transparent manner;
- (c) Lack of a clear framework and institutional arrangements for handling of Power Purchase Agreements (PPA) or Feed-in-Tariffs (FiT)<sup>4</sup>, connection to grid, permits and procedures to set up power generation companies, and others;
- (d) Lack of climate resilience and adaptation regulatory framework, including for example, for disclosure of climate change risks associated with private investments;
- (e) Ingrained reliance on subsidized fossil fuels and lack of renewable purchase obligation on consumers/ utilities;
- (f) Ingrained reliance on the use of subsidized fossil fuels, for which associated negative externalities are not adequately priced, and lack of renewable purchase obligation placed on consumers / utilities; and
- (g) Trade barriers that limit the use of most efficient technologies at lower cost to consumers.

10. Kenya and Ethiopia are two examples of countries who, motivated by the economic opportunity and unique local potential in renewable energy, took advantage of the availability of international funding to enhance private sector capacity. Both countries enhanced advisory services and made improvements to appropriate policies and agency structures, alongside the promotion of funding windows for private sector players. They both used two parallel paths.

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<sup>3</sup> Climate Policy Initiative, The Global Landscape of Climate Finance 2015, November 2016.

<sup>4</sup> A FiT guarantees that for a certain term, renewable electricity generated by a qualifying facility must be purchased at a certain fixed price, which provides a fixed return to the producer.

The first one focused on internal capacity building and policy reform (regulations specific to renewable energy, permits, FiT, taxation). The second path was to facilitate access of the private sector to information through the creation of a “one stop shop” dedicated to private sector renewable energy investment, providing developers with explicit requirements for permitting, authorization, access to finance, technology advice, and available financing windows.

11. In another example of progress being made on the regulatory side, the French government passed the Energy Transition law, in 2015. Article 173 of the law will require compliance by institutional investors to disclose the transition, physical and liability risks of climate change in their investments by July 2017. Similarly, the G20 launched the Task Force on Climate-Related Disclosure (TCFD) to focus on voluntary approaches to disclosure of climate risk.

12. Mexico provides another positive example of overcoming such barriers. Its General Climate Change Law (GLCC), issued in 2012, defined planning and policy instruments, institutional arrangements, and provided general guidance for the implementation of climate policy. It also mandated that CO<sub>2</sub> emissions be reduced by 30 per cent from business-as-usual levels by 2020, and by 50 per cent by 2050. In its 2016 Climate Change Mid-Century Strategy, Mexico has gone further by setting sectoral targets. Given emissions from transportation (on-road and non-road mobile) represented about 26 per cent of total national emissions in 2013 (corresponding to 174,156.53 Gg of CO<sub>2</sub>)<sup>5</sup>, two emissions reduction oriented actions in the transport sector were included in the strategy<sup>6</sup>. These policies have triggered multiple sustainable transport projects including a USD150 million commitment by the City of Mexico in 2015 to invest in Bus Rapid Transit (BRT) that was co-funded by multilateral development banks<sup>7</sup>.

13. India’s National Solar Mission under the initiatives of the National Action Plan on Climate Change has shown tremendous achievements of over 12,000 MWs of solar power generation in a matter of few years and driving solar power prices lower than that of fossil fuels. The introduction of a renewable purchase obligation law under the country’s electricity act stimulated distribution companies to create a competitive auction process for solar procurement. Further, the creation of Solar Parks by the Government of India streamlined the land procurement, permitting and power evacuation complexities and coupled with falling prices of solar panels led to historic low pricing of power through renewables years ahead of forecasts.

#### 2.1.2 Inconsistency of Policy Support and Long-Term Commitment by Government

14. Experience in many countries demonstrates that consistent and long-term planning and government commitment are key for successful renewable energy projects.<sup>8</sup> Such projects tend to have long-term profit horizons, which make them intolerant to constant policy shifts and change of direction. Inconsistency could also result from contradictory regulations and lack of coordination among various government departments, giving conflicting signals and inconsistent support levels.

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<sup>5</sup> Climate Change Mid-Century Strategy, at: [https://unfccc.int/files/focus/long-term\\_strategies/application/pdf/mexico\\_mcs\\_final\\_cop22nov16\\_red.pdf](https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf).

<sup>6</sup> Among other actions: (i) To encourage the evolution towards safe, clean, low-emission, accessible, and comfortable public transportation systems, and (ii) to promote efficient and low-emission transportation systems, and to modify the regulatory and pricing framework in order to foster reinvestment and continuous improvement.

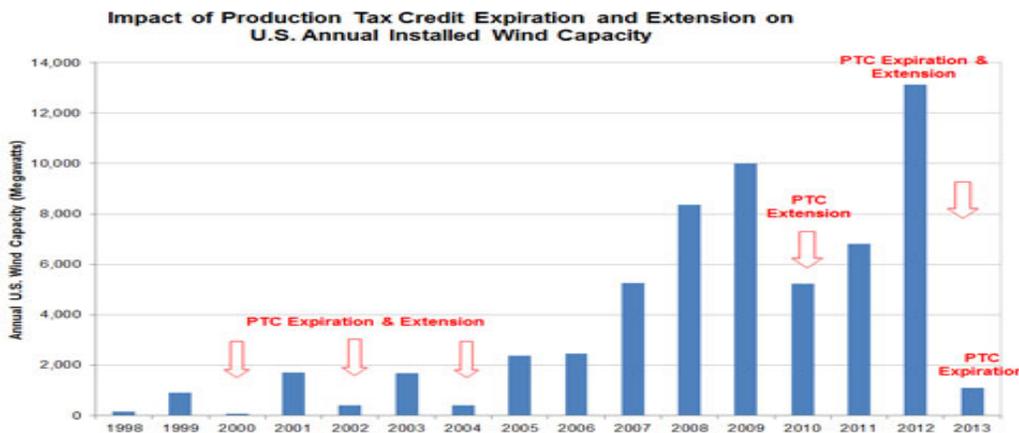
<sup>7</sup> WRI, \$150 Million to Transform Sustainable Transport in Mexico City <http://www.wri.org/blog/2015/03/150-million-transform-sustainable-transport-mexico-city>.

<sup>8</sup> Power for All, Decentralized Renewables, From Promise to Progress, March 2017, at: <https://static1.squarespace.com/static/532f79fae4b07e365baf1c64/t/58e3f73ce4fcb5a3a0989855/149133497977/Decentralized-Renewables-From-Promise-to-Progress-March-2017.pdf>.

15. For example, in 2016, overall renewable energy investment fell by 30 per cent in developing countries (from USD167 billion in 2015 to USD116.6 billion in 2016). While this is attributed to multiple factors including the strong USD (lower dollar-denominated capex costs per megawatt) and falls in technology cost (about 17 per cent across all technologies), some of the decrease is attributed to a lack of policy support in countries where projects were delayed, such as South Africa, Mexico, and Brazil.<sup>9</sup>

16. The renewable energy sector in Southern European countries (Portugal and Spain) also suffered a major setback as a result of inconsistent policy support following the 2008 financial crisis. Legislators chose to reduce or retroactively withdraw subsidies granted to renewable energy producers. This resulted in many global leading producers of innovative and profitable technologies being forced to contract commercially and financially.

17. The U.S. solar market suffered the same consequences as a result of a lack of long-term commitment by government as to fiscal incentives - Production Tax Credit (PTC) - to consumers and producers of energy (figure 1).



**Figure 1. Impact of Production Tax Credit Expiration and Extension on U.S. Annual Installed Wind Capacity**

Sources: Compiled by Union of Concerned Scientists (UCS) based on data from U.S. Department of Energy (DOE) 2013 and American Wind Energy Association (AWEA) 2014

### 2.1.3 *Absence of Explicit Incentive Systems*

18. Incentives range from fiscal and financial incentives to land rights, government guarantees, R&D budget, power purchase agreements and feed-in-tariffs. Typically, the more explicit and higher the incentives, the higher the engagement of the private sector and the investors' appetite for risk. Incentives can be tailored to address both sides of demand and supply, project developers and utility companies as well as consumers. The German and Californian (Investment Tax Credit) models proved to be successful in mainstreaming renewables in market and consumer behavior. Innovative consumer financing solutions and tax incentives created a domino effect and allowed stimulation of further technological innovation, which has driven prices down.

19. In summary, certainty, transparency, and longevity are key parameters to address policy barriers and associated risks.

<sup>9</sup> UN Environment and Bloomberg New Energy Finance' "Global Trends in Renewable Energy Investment 2017,"

## 2.2 Access to Climate Finance and Local Market Barriers

### 2.2.1 Capital Market Capabilities on a National Level

20. In many developing countries capital markets are nascent, credit and equity markets are shallow, and liquidity is thin (particularly in LICs and LDCs).<sup>10</sup> The degree of development of the capital markets in a country has a direct impact on investors' confidence. This is especially true in climate-related projects as these are new sectors, many of which are pre-commercial. Appropriate and transparent capital market infrastructure, clear banking regulations, clear foreign investment and repatriation laws, adequate institutional arrangements, and efficient treasury support together can benefit the development of climate mitigation and adaptation projects and programs on a national level. Conversely, a lack of developed capital market reflects on the range of options in terms of financial instruments and products offered locally.

21. The above barriers have practical implications on the appetite of investors and financiers to invest in developing countries that have a weak financial sector. For example, local currency lending is key for the viability of climate finance deals in developing countries; however many low-income and some middle-income countries do not have a swap market or appropriate financial mechanism and rules allowing the use of local currency risk hedging instruments. Sovereign guarantees of the local currency debt component might be an option if sovereign credit rating is acceptable to investors, which is often not the case particularly in LDCs.

22. Similarly, certain climate resilience projects require "patient capital" given the long-term horizon of positive cash flows in some sectors, and renewable energy projects often require early equity to make projects bankable and others need growth capital. However, certain countries' legislation limits equity and quasi equity investments, for lack of a framework supporting exits and put/call options, which in turn limits investors' exit strategy options and discourages them from investing in these markets. Also, banking regulations in some developing countries restrict repatriation of funds.

### 2.2.2 Demand-Supply mismatch

23. The demand-supply mismatch extends across the value chain of each of them and is driven by the financial offering (financial instrument and terms, and execution cost), lack of knowledge and training on both sides of demand and supply, and an overall inappropriate enabling environment.

24. On the demand side:

- (a) *Absence of a consumer base:* The absence of consumer awareness and knowledge, lack of fiscal incentives and financial schemes to encourage and enable consumers (households and corporates) to purchase renewable energy can for example delay the formation of a local renewable energy demand. As referred to in paragraph 10 above, the Californian and German incentive models triggered a positive effect on creating demand locally that supported project developers and incentivized both producers and consumers. The same applies to potential climate resilience projects that can develop in agricultural communities, but the fact that significant part of populations in developing countries live in rural areas, there is a knowledge barrier, which would require new types of

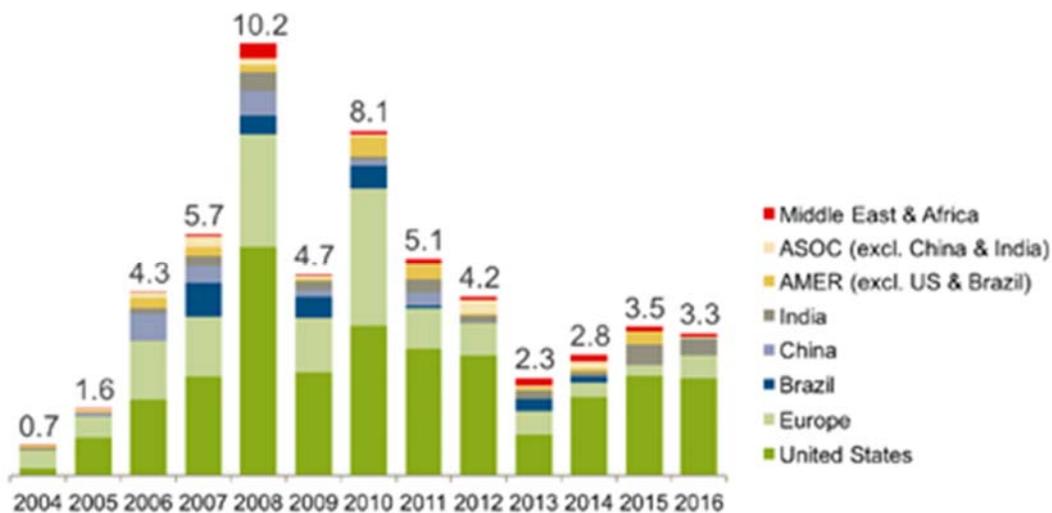
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<sup>10</sup> Based on Ease of Doing Business rankings ([www.doingbusiness.org/rankings](http://www.doingbusiness.org/rankings)), the majority of LDCs represented fall in the bottom fifth of rankings worldwide. Thus, the absence of an enabling environment for businesses to develop stands as a major impediment to the development of energy sector in most of the LDCs.

- partnerships to build up knowledge and leveraging existing locally trusted organizations (NGOs/CSOs) to undertake this work;
- (b) *Lack of sophisticated project developers:* In developing countries, renewable energy project developers experience fragmentation and inefficiencies. Many project developers lack financial strength, experience, creditworthiness, or collateral to borrow locally;
  - (c) *Lack of sizeable pipeline of climate adaptation projects:* In the case of climate adaptation and resilience projects, businesses and particularly SMEs, have difficulties articulating the business case to investors and financiers due to lack of adequate training to assess returns on investment (ROI) and to measure the risks and their implications on the business;
  - (d) *The implicit nature of benefits from energy efficiency and resource maximization:* Given that the benefits of energy efficiency and resource maximization are not explicit and don't contribute explicitly to positive cash flow projections, manufacturers tend to focus more on production expansion and sales growth and less on improving energy efficiency and operating cost, which would usually require some capital expenditure in efficiency improvements. Consequently, compared to a renewable energy project, the return on investment (ROI) is calculated as a saved cost and not as a profit/return; and
  - (e) *Unsupportive business environment for SMEs and women-owned businesses:* In low- and middle-income countries most of clean energy and climate resilience industries are driven by SMEs that receive little support from the local banks, insurance companies, and regulators. Community driven businesses and cooperatives with viable business proposals receive very little attention from local banks and even microfinance institutions particularly when their proposals are climate related. This lack of support has prevented the industry from maturing. Similarly, access to finance by women entrepreneurs in developing countries in general and in these industries in particular presents a double challenge. The necessary capacity building and business support by women dedicated government programs is lacking particularly in SMEs in the area of climate resilience (e.g. agribusiness supply chains).
  - (f) *Lack of professional and technical skills:* Many project developers in developing countries lack technical expertise and sufficient financial skills to submit competitive proposals based on best industry standards.
25. On the supply side:
- (a) *Knowledge of the sector by financiers and investors:* Local banks and investors lack knowledge of climate-related businesses and sectors and are reluctant to hire an in-house technical team to undertake due diligence and risk assessment to approve funding requests of local project developers.
  - (b) *Uncertainty associated with the physical risk assessment of adaptation projects:* Project developers and investors report reluctance in making climate adaptation and resilience investments because of lack of clarity about the location, magnitude, potential timing and consequences of climate risks and the challenges of incorporating scientific climate change data into shorter term, location-specific practical investments.<sup>11</sup>
  - (c) *Absence of long-term debt maturities:* The lack of long-term financing in certain developing countries and high financing cost are barriers to financing climate-related projects. The long-term contracts of renewable and forestry projects, for example, require long-term tenors, which is difficult to secure locally.

<sup>11</sup> Global Adaptation and Resilience Investment Work Group, Bridging the Adaptation Gap

- (d) *Financial institutions hurdle:* Many financial institutions hesitate to develop renewable energy and energy efficiency financing business lines given the cost involved in the learning curve and new procedures to be adopted when some of the technologies have no track record of revenue generation. As for developing climate resilience investments by commercial banks in developing countries, the issues can very much be associated with lack of awareness of risks and opportunities of climate change and/or inability to evaluate and incorporate climate change risks into investment or financing decision-making.
- (e) *Private Equity (PE) and Venture Capital (VC) Funds:* In general, in low-income countries, the renewable energy industry has not benefited from the presence of local early (venture) and late (growth) equity players. These are riskier investments typically offered by venture and private equity groups. Barriers to private equity and venture investment in developing countries include the difficulty of fundraising domestically. In middle-income countries, there is moderate PE and VC investment activities in clean technologies but not in renewable energy or climate resilience. Most of the renewable energy projects in these countries are being financed through asset finance lending (including balance sheet finance and bonds). In 2016, for example, PE/VC investment in renewable energy reached USD 3.3 billion<sup>12</sup> of which USD 2.3 billion was committed in the USA, USD 0.5 billion in Europe, and the rest was spread among China, Brazil and India (figure 2).



**Figure 2: VC/PE NEW INVESTMENT IN RENEWABLE ENERGY BY REGION, 2004-2016, USD BN**

Source: UN Environment, Bloomberg New Energy Finance

<sup>12</sup> Frankfurt School – UNEP Collaboration Center, Un Environment, Bloomberg New Energy Finance, “Global Trends in Renewable Energy Investment 2017”, April 2017

- (f) *Institutional Investors:* Institutional investors<sup>13</sup> present the largest potential source of funding with sizable portfolios, sophisticated strategies, and appetite for long-term investment horizons. Global institutional investors manage nearly USD 70 trillion in assets.

Institutional investors operate within certain constraints that are driven by their investment strategies, local authorities' regulations (some can only invest in renewable through PE/VC groups) and criteria such as a threshold on high-risk investments, shareholders preference in terms of geography or theme (gender, education, climate) impact area. These barriers prevent them from investing in climate-related sectors and projects in developing countries. Their investment decisions are driven by parameters of liquidity, diversification and risk exposure, scale of transactions, and cost effectiveness from transaction and portfolio management standpoints.

In adaptation, the primary challenge for institutional investors is twofold: the uncertainty resulting from their lack of ability to assess physical risks, and to quantify them for lack of well developed or adopted tools for evaluating the risk and return of investments in adaptation and resilience.

In mitigation, institutional investors have the capability to provide direct funding to renewable energy projects or pooled investment vehicles in such projects. For individual projects, scale is key since transaction costs are similar for all project sizes. Many institutional investors lack the capacity or mandate to form an in-house investment team to perform the due diligence, structuring and negotiations that are required for good project selection. For pooled renewable energy investment vehicles, there are currently limited options beyond green bonds, which tend to be bought by European and North American pension funds and insurance companies to allocate funds with relatively low risk exposure and low transaction cost.

There is a need to design pooled investment vehicles that: i) align the interest of institutional investors with those of specific climate-related sectors; ii) create mechanisms of short-term liquidity; iii) allow adequate diversification, and iv) involve low transaction costs while maintaining the link to underlying cash flows from renewable energy projects.

- (g) *Risk-reward profile and investors' risk appetite:* Financing risk and returns are derived from investors' risk perception. Often local financial institutions and institutional investors who do not fully understand the low and moderate technology risk of some tested renewable technologies demand high returns on investments. This misperception of risks has prevented the local renewable industry from developing.
- (h) *Transaction size/Cost barrier:* Also, the high transaction cost relative to small size projects is a factor to consider by institutional investors and financiers who look for efficient use of resources. This makes large investors and financiers focus on large-scale projects, discriminating against a multitude of small to medium scales and innovative business models, unless such small-scale projects can be bundled to enable the engagement of institutional investors.

### 2.2.3 Market Gap – The limited offering of a range of financial instruments

26. Concessional financing by international institutions has been primarily offered to climate-related projects in the form of concessional loans, risk sharing facilities (RSF), and grants. Loans have been most used among all instruments given that they are easier to execute;

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<sup>13</sup> Institutional investors include pension funds, sovereign wealth funds, insurance companies, foundations and endowments.

they have been offered in subordinated terms through lower interest rates, longer maturities, and subordinated security arrangements.

#### **2.2.4 Local currency financing**

27. Currency fluctuation risk has an impact on project developers as it adds to the asset-liability mismatch. This happens in cases of imported technology and equipment, foreign currency loans, or export of energy to another country where the proceeds of payments are in hard currency. As revenues are expected to be in local currency, a developer's balance sheet is exposed to a foreign exchange risk. Within the available schemes of international concessional public financing, funding flows are disbursed in USD or Euro, which presents a bottleneck particularly for developing countries with high currency fluctuations. The question that remains is who bears the currency risk: the end recipient of funding, the implementing agency/entity, or the source of the concessional funds. From a private sector standpoint, the positive effect of concessional funding is washed out by the currency risk and the cost of hedging it in the SWAP market, assuming a SWAP market exists in a developing country, which is not always the case.

28. In case the host government would provide a guarantee for the hard currency debt from foreign lenders, it exposes the government to a higher degree of risks (than providing a guarantee on local currency debts). On the side of the foreign investor, in terms of purely credit considerations, as pointed out, the foreign investor would benefit from the government guarantee and would not bear the currency risk.

#### **2.2.5 Equity products**

29. Equity products remain underserved by both private investors and major public finance institutions. Equity instruments have been used to a very limited extent due to two factors. First, the lack of private equity and venture capital industry in many developing countries and particularly in LICs and LDCs. Second, the low risk appetite of both private and public institutions, development banks and their shareholders to engage in riskier financial instruments such as equity and quasi equities/convertibles and in new sectors.

30. Equity products are relevant to a range of climate-related projects, including for the innovative technologies and start-ups segment, which is still underfunded by both private investors and public finance institutions. The majority of international public funding goes to mature and proven technologies, as is the case for MDBs, bilaterals and public global funds portfolios. The result is that the demand for financing by a whole segment of innovative technologies is not being addressed. This becomes even more relevant in the context of developing countries, given the absence of a mature private equity and venture capital industry in these markets.

#### **2.2.6 Guarantees**

31. Guarantee instruments have been used to a large extent in the form of Risk Sharing Facilities (RSF) via local financial institutions to deploy funding by multilateral development banks and bilaterals, primarily into energy efficiency and renewable energy. However, direct guarantees have been used to a much lesser extent, although they are relevant and can mitigate various risks including political and policy (for PPAs and FiT) and credit risk. It is estimated that three quarters of IFC investment in clean energy has been deployed through RSF to local

financial institutions. EBRD, for example, relies heavily on RSFs as an efficient instrument to scale up investment in local markets at a lower transaction cost.<sup>14</sup>

### 2.2.7 Insurance

32. Insurance and reinsurance products offer a wide range of solutions that can enhance climate resilience through managing and offsetting climate related risks, including infrastructure insurance, credit insurance, Natural Catastrophe Protection of energy gaps, etc. The increasing severity and frequency of weather-related catastrophes have an enormous cost (human and economic), which requires use of diversity of instruments to enhance communities' resilience against climate risks. Also, private insurance players have been instrumental in innovative products tailored to a range of climate change risks and have invested significantly in closing/covering the renewable energy production shortfall gap, which is key to enhance the financial viability of projects.

## 2.3 Affordability and Technology Barriers

33. In climate adaptation, barriers to private sector investment include technology transfer to developing countries, and the integration and transfer of knowledge for adaptation in businesses, alongside the uncertainty, unfamiliarity and limited understanding of climate adaptation risks and concrete investments that can be made to address them.<sup>15</sup>

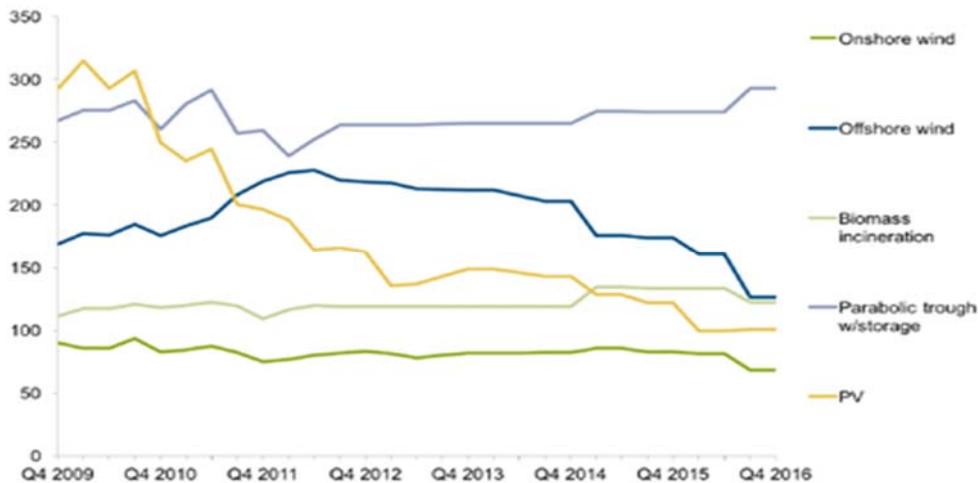
34. In mitigation, while the cost of technology across climate-related sectors has dropped significantly in the last decade, particularly in the renewable energy sector, the upfront cost of setting up projects remains a key barrier. As an example of the increased cost competitiveness of renewable energy technologies, figure 3 demonstrates the cost evolution per technology in the period between 2009-2016.<sup>16</sup>

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<sup>14</sup> Climate & Development Knowledge Network (CDKN), "Using blended finance to overcome barriers to climate investments", January 5, 2017.

<sup>15</sup> UNEP's 2015 Adaptation Gap Report.

<sup>16</sup> Frankfurt School – UNEP Collaboration Center, UN Environment, Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investing 2017", levelised costs for PV without tracking varied greatly by country and project, but the central estimate was USD 101 per MWh, down 17 per cent in just one year. Onshore wind's central levelised cost estimate was USD 68 per MWh in H2 2016, down 18 per cent in a year, while that for offshore wind was USD126, down 28 per cent.



**Figure 3: Levelised cost of electricity from selected renewable energy sources, Q3 2009 to Q2 2016 USD per MWh**

Source: Bloomberg New Energy Finance<sup>17</sup>

35. Barriers to technology and affordability can be classified under three themes:
- (a) *High technology and upfront cost of projects:* Taking the example of a renewable energy project, for the same capital injection, a renewable energy project's installed capacity is lower than one using conventional energy, thus investors prefer to engage in the latter as the cost of capital is more competitive and productivity is higher, and this is despite the investment growth trend in renewable energy which has surpassed growth of investment in conventional energy. While the cost of new generations of technologies have dropped significantly, and the competitiveness gap vis-à-vis conventional technologies has been gradually shrinking, the demand for low cost financing to set up generation facilities remains unmet and would require further blended finance solutions; concessional public sources that would address the financial viability gap and support future cash flows of private developers.
  - (b) *High cost of capital:* Given the majority of climate-related projects are financed through a combination of debt and equity (often 70-75 per cent to 30-25 per cent ratio), their overall cost of capital is usually derived from a weighted average of all capital sources.<sup>18</sup> As the cost of capital represents a hurdle rate that a company has to overcome in order to generate value and become profitable, it is used as a barometer to assess whether a project should be financed or not. The cost of capital varies depending on the country's financial market and factors such as the risk profile of a project, operating cost, profitability, credit worthiness of sponsors, etc. In general, newer market entrants with a limited operating history will have higher costs of capital than established companies with a solid track record, since lenders and investors will demand a higher risk premium for the former.
  - (c) *Access to technology:* The major suppliers of technologies are concentrated in China, Europe, Japan and the U.S. Project developers in developing countries experience barriers to acquiring technologies and entering into turnkey contracts with

<sup>17</sup> Frankfurt School – UNEP Collaboration Center, Un Environment, Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investing 2017".

<sup>18</sup> Widely known as the weighted average cost of capital (WACC).

international technology providers due to their lack of credit history and credit rating, and mostly the very expensive cost of proprietary technologies.

## 2.4 Knowledge and Education Barriers

36. Despite the major progress made globally in raising awareness of climate change impact in recent years, there is still much work to be done particularly in developing countries to highlight the negative impact of climate change and its implications, alongside the benefits of climate-related projects and programs.

37. The barriers to increased investment and capital mobilization by the private sector as a result of lack of knowledge have negatively impacted climate mitigation and adaptation actions in developing countries. The impact ranges from corporates, SMEs, government and public institutions to local banks and civil society. Lack of awareness of risks and opportunities and inability to incorporate climate change risks into investment decisions, and the lack of proper training in climate mitigation and adaptation and climate finance is delaying the design and implementation of adequate support and strategies to the private sector to engage and invest. The same applies to local financial institutions' lack of capacity to evaluate climate-related project proposals from local developers to assess the associated credit risks, and to structure term sheets in manners that anticipate and mitigate risks, which is a major barrier for fund raising by project developers.

38. The other implication of lack of capacity by local financial institutions (FIs) is that the combination of lack of knowledge of climate-related sectors and complicated reporting requirements with technical details contributes to the increased cost for FIs and their portfolio clients. Given these barriers, financing at market rates does not provide local FIs with sufficient incentives and returns to venture into this line of business.

39. Given the complexity associated with climate resilience and the range of impacted sectors, tackling the knowledge gap by governments, municipalities, SMEs and local businesses would require a selective assessment of the most needed interventions, establishing frameworks for decision-making, and methods to measure cost-benefit ratios of interventions. Such an approach would result in higher certainty by investors and financiers as to the trustworthiness of processes and guidance put in place as a result of appropriate training and capacity building. Work undertaken by insurance industry actors for example in setting decision-making frameworks is a valuable tool for stakeholders and local communities to assess their options.<sup>19</sup>

40. Investment packages bundled with capacity building therefore play a fundamental role to transform climate-related industries. As such, packages conceived by international climate investment funds and development banks to provide capacity building, technical assistance and training to local FIs, governments, businesses, and civil society organizations are key to addressing such barriers of knowledge and experience.

## 2.5 Region and Country-related Barriers and Risks

41. Addressing barriers to private sector investment in climate-related industries must take into consideration the local context of developing countries. The landscape of barriers is not

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<sup>19</sup> Economic of Climate Adaptation (ECA) Working Group, "Shaping Climate Resilience Development – A framework for Decision-Making" ([http://media.swissre.com/documents/rethinking\\_shaping\\_climate\\_resilient\\_development\\_en.pdf](http://media.swissre.com/documents/rethinking_shaping_climate_resilient_development_en.pdf))

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consistent across countries and regions and climate finance solutions have to be tailored to local conditions, in order to attract private sector investment.

42. Financing climate-related projects gives rise to a set of risks, both real and perceived, that act as barriers to private sector investment. While deploying capital in developing countries can present an attractive source of returns and portfolio diversification for private sector investors and financiers, private sector actors have varying thresholds of risk tolerance in developing countries, and may be seeking different levels of returns depending on their specific mandates. For example, the risk appetite of a pension fund is not the same as a private equity fund specialized in renewable energy.

43. It should be noted that most of these barriers are common challenges to private investment in developing countries and not specific to climate-related investments. However, they may be exacerbated as result of the promotion of new climate technologies and innovations, policy and regulatory barriers, financial barriers, the lack of awareness amongst businesses and governments about the potential climate-related risks and opportunities, as well as technical or capacity-based barriers hindering climate-related investments.

### III. Recommendations by Private Sector Advisory Group

44. This section of the paper proposes a set of recommendations from PSAG members based on their discussion and review of Sections I and II of this paper. PSAG's proposal follows the same structure of the analysis undertaken by GCF PSF in the sections above.

45. PSAG would like to emphasize the substantial role the private sector plays in climate mitigation, adaptation and resilience, and that engagement with the various private sector actors and stakeholders is crucial to scale up investment, enhance innovation, and increase financial leverage. Furthermore, consistent with PSAG's recommendations to the GCF Board (Inf. 3 – B.16, No. 20), *"PSAG stresses that, while the private sector is fundamental to the success of the GCF, the mandate of the GCF includes delivering in pre-commercial contexts where the private sector alone cannot provide all that is needed. The PSAG therefore recommends to ensure balanced, multi-stakeholder, differentiated, and integrated approaches to market activation for delivering mitigation and adaptation outcomes."*

#### 3.1 Policy and Regulatory Barriers

46. These barriers are usually related to inadequate public strategic and regulatory frameworks for several sectors (energy, agriculture, forestry, etc.), coupled with a set of retrograde policies that provide incentives for fossil fuels and carbon intense products and services, and finally, changes need a long-term commitment by governments to support climate-related businesses and market development, which in the end requires strong public institutions.

##### **Recommendation 1:**

47. Assist local governments to identify the most obvious and urgent regulatory initiatives that could strengthen the existing frameworks or create new ones. An assessment of priority initiatives that target specific sectors that are more vulnerable to climate change could be led and carried out by the government and regulators in consultation with stakeholders from the private sector and civil society organizations, and could be built around a strategic plan and a multi-stakeholder engagement plan considering the short-, mid-, and long-term timeframes. Barriers associated with knowledge and capacity gap should be also identified to complement the regulatory strengthening effort.

48. It is proposed that the assessment and the identified short-term actions be funded by GCF Readiness Program as this fits its mandate and scope of work. GCF could play a catalytic role in proposing a template for such a collaborative process, which could result in transformative shift in certain sectors.

49. A particular consideration should be paid to whether the policy changes required can be achieved in phases (short- to long-term) and whether each phase can be measured by specific deliverables/results that actually unlock some of the identified barriers, preparing the ground for the next phase. To bet solely on long-term policy changes would not be an effective option as the paradigm shift needs to happen sooner and capture all market segments.

#### 3.2 Access to Climate Finance and Local Market Barriers

##### **Recommendation 2:**

50. PSAG would encourage interventions using public climate finance in mitigation and climate resilience including:

- (a) *Public-private initiatives* that can develop innovative solutions to persistent investment barriers, including in energy efficiency, supply chains risk management, and waste to energy;
- (b) The creation of a Green Bank could be a transformative public-private initiative which can boost market adoption and crowd-in more private sector investments;
- (c) Financial instruments (including *ESCOs schemes*) to guarantee the promised savings from energy efficiency investments can address viability and risk gaps by assuring investors of their returns;
- (d) Hedging solutions to offload various risks, including local currency hedging using blended finance solutions to help address foreign exchange risk;
- (e) Financial structures and business models that favor the low carbon economy through creation of innovative and responsive public-private instruments that incentivize de-risking investments, such as *guarantee products*, including risk sharing facilities which allow scale up of investment in private sector operations;
- (f) Explore instruments that can help small communities such as guarantees and FiT;
- (g) Insurance products in offsetting risks associated with climate resilience and adaptation and in some segments of renewable energy supply gap; and
- (h) Vehicles that fit with institutional investors asset allocation preferences and allow scale up approach in segments of the market where there is need for scale financing.

### 3.3 Affordability and Technology Barriers

51. As outlined in Section II, the affordability and access to technology are clear barriers to private sector implementation of projects in climate mitigation and adaptation. Also, in addition to technology transfer challenges, local innovation and adaptation of technology to local conditions are also barriers to be addressed<sup>20</sup>.

52. Furthermore, given the initial investment cost of clean technology is higher than the conventional, but the operational cost of low-carbon based technology is much lower (as is the case for solar technology). This means renewable energy projects are more affordable to low income populations in developing countries, as long as the initial capital investment is available with proper public sector partnership.

53. Technical assistance on a programmatic level is key to address macro barriers; however, technical assistance to individual projects remains key to their success and to risk mitigation at the outset.

#### **Recommendation 3:**

54. Support by GCF targeting technology and affordability barriers could add great value to developing countries and can stimulate much collaboration south-south and north-south, to reduce barriers, while creating the necessary environment for new and innovative technologies to emerge.

55. Examples of how to overcome affordability and technology barriers include a public-private initiative, under *India Innovation Lab for Green Finance*, which identifies, develops, and accelerates innovative solutions to finance green infrastructure for renewable

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<sup>20</sup> Global Adaptation & Resilience Investment Working Group, "Adaptation Gap report", November, 2016.

energy (including utility scale, distributed, and off-grid), energy efficiency, urbanization, and other channels for green growth”<sup>21</sup>.

56. Instruments that provides climate finance solutions to overcome affordability and technology barriers, included:

- (a) The Rooftop Solar Private Sector Financing Facility, which aims to drive capital at a lower cost of financing for developers of rooftop solar projects, by providing long-term debt financing and bundling small projects through securitization;
- (b) Loans4SME is a peer-to-peer lending platform that would increase access to debt financing for small and medium enterprises (SMEs) for renewable energy and energy efficiency initiatives, by connecting them directly with lenders<sup>22</sup>;
- (c) The FX Hedging Facility aims to facilitate large-scale foreign investment into renewable energy in India by providing a cheaper currency hedging solution.

### 3.4 Knowledge and Education Barriers

57. There is a global consensus that if current public policies are favorable for the “business as usual” models, then climate investment through the private sector is unlikely to sufficiently scale up renewable energy, energy efficiency, build up resilience, or drive transition to a more sustainable supply chains. Added to that as mentioned in Section I and II above, this is especially true in developing countries where lack of access to capital is large and the perception of risk continues to limit private sector and investors’ engagement.

58. The statement in para 37 above, “*Lack of awareness... and proper training in climate change and climate finance is delaying the design and implementation of adequate support and strategies to the private sector to engage and invest*” reflects the current situation and should be tackled in order to help developing countries to overcome such barriers.

59. Also it has been demonstrated that “*Markets sometimes lag behind innovative business models even when they are commercially viable*”<sup>23</sup>. *Show casing successful projects and business models through innovative and targeted marketing efforts can “open up new opportunities, helping to accelerate investment and make up lost ground*”<sup>24</sup>.

60. It is recommended that lack of institutional capacity in developing countries should be addressed as an over-arching theme by GCF given that many developing countries lack the in country (in-house) expertise to deal with all the risks and barriers to unlock private sector development and further investment.

61. GCF could play a catalytic role in providing funding and guidance to developing countries and particularly tailored programs to SIDS and LDCs to empower their public institutions and help reduce the education barrier in the area of climate mitigation, which in the future will be fundamental to unlock access to private sector.

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<sup>21</sup> Climate Policy Initiative, “India Innovation Lab for Green Finance: 2015-2016 Cycle Instrument Analysis”, October, 2016.

<sup>22</sup> According to CPI, “By utilizing a resilient credit risk assessment module that incorporates a wide range of data elements as compared to traditional credit scoring mechanisms, Loans4SME will focus on cash flows and the repayment capabilities of the projects in order to increase investor confidence and offer timelier financing when compared to traditional lending.”

<sup>23</sup> Climate Policy Initiative (CPI), “The Lessons and Innovations to Spur Green Investment in Developing Countries”, April, 2017.

<sup>24</sup> Ibid.

#### **Recommendation 4:**

62. To support private sector investment in energy efficiency, it is suggested that GCF support countries to set up and adopt a reporting/monitoring system of energy consumption on the local businesses and industrial operations to provide a base on quantitative assessment of the energy use and cost. This first step could be followed by providing financial support to:

- (a) Set up private public partnerships whereby experts from developed or developing countries can provide technical assistance and build local capacity of local industries and assist in a pragmatic shift; and
- (b) provide funding instruments for local businesses to implement necessary capital expenditures and investment in energy efficient operations.

#### **Recommendation 5:**

63. A Climate resilience targeted capacity building and awareness program supported by GCF can help support countries to overcome barriers to private investment in climate resilience and adaptation resulting from the knowledge gap: lack of knowledge production, inadequate integration of knowledge, and limited transfer and uptake. GCF could also assist regions and countries, which lack a systematic identification and analysis of the above barriers<sup>25</sup>.

64. Furthermore, the GCF could design interventions to invest in demand growth activities, such as training on climate resilience, insurance, productive uses of energy, supply chains efficiencies, and other measure necessary to build demand for private sector services.

#### **Recommendation 6:**

65. Sharing information across public bodies and institutions on how national governments and development finance institutions can leverage private investment will be crucial for the private sector, with emphasis on underserved segments such as SME development, women access to finance, and risk capital/innovative startups.

### **3.5 Region and Country-related Barriers and Risks**

66. Each country has its own specific barriers and thus a single solution cannot meet all the requirements to mitigate risks and unlock private sector climate investment. However, governments and development finance institutions can work together to leverage private investment through new approaches and actions to address fundamental risk barriers and unlock finance that would otherwise prevent private developers from investing in some developing countries.

#### **Recommendation 7:**

67. Areas that GCF could support and that can address cross cutting issues include:
- (a) Well-designed Power Purchase Agreements in the case of the energy sector, with government-backed guarantees and assurance, which could prove crucial to unlock the long-term debt finance needed to develop large projects;<sup>26</sup>
  - (b) Well-tailored fiscal policies could encourage private sector investment. For instance, in the case of agriculture, with a proposal to tax the production area rather than production volumes or profits, governments can incentivize a more productive land use.

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<sup>25</sup> Global Adaptation & Resilience Investment Working Group (GARI), "Adaptation Gap report", November, 2016.

<sup>26</sup> Climate Policy Initiative "The Lessons and Innovations to Spur Green Investment in Developing Countries", April, 2017.

This may encourage adoption of new methods and more sustainable and efficient agriculture, achieving higher productivity (yield) per cultivated area;

- (c) Given the shortage of a pipeline of viable investments for financiers and investors, once policy and enabling environment barriers are addressed, a long-term business skills building locally is fundamental to building investor pipelines. GCF can play key role by designing pragmatic approaches to long-term engagement in supporting building business skills in developing countries.
- (d) Introduction of sustainability indicators, linking tax rates to sustainable development criteria, which could also reward environmentally friendly behaviour; and
- (e) Sharing information across public bodies and institutions on how national governments and development finance institutions can leverage private investment will be crucial for the private sector, with emphasis on underserved segments such as SME development, women access to finance, and risk capital/innovative start-ups.

68. These recommendations are not exhaustive and many other aspects should be considered, however, each country needs to identify its own key priority list of barriers and address them in order to drive green investment by the private sector. Further clarity by governments and regulators would result in a clear path to private investors; e.g. providing insights on how effective fiscal policy design is, to incentivize more productive and sustainable forms of land use, for instance, or low carbon technology deployment for both mitigation and adaptation.

69. It is noteworthy to mention that given the specific challenges facing LDCs and SIDS, GCF PSF is currently developing a proposal for financial modalities to enhance private sector investment in these countries.

**Table 1: Summary Recommendations**

<b>Barriers</b>	<b>Recommendations</b>
<b>Policy and Regulatory Barriers</b>	<p><b>Recommendation 1</b></p> <p>Assist local governments to identify the most obvious and urgent regulatory initiatives that could strengthen the existing frameworks or create new ones. An assessment of priority initiatives that target specific sectors that are more vulnerable to climate change could be led and carried out by the government and regulators in consultation with stakeholders from the private sector and civil society organizations, and could be built around a strategic plan and a multi-stakeholder engagement plan considering the short-, mid-, and long-term timeframes. Barriers associated with knowledge and capacity gap should be also identified to complement the regulatory strengthening effort.</p>
<b>Access to Climate Finance and Local Market Barriers</b>	<p><b>Recommendation 2</b></p> <p><i>Public-private initiatives</i> that can develop innovative solutions to persistent investment barriers, including in energy efficiency, supply chains risk management, waste to energy, and forestry.</p> <p>The creation of a Green Bank could be a transformative public-private initiative, which can boost market adoption and crowd-in more private sector investments.</p> <p>Financial instruments (including <i>ESCOs schemes</i>) to guarantee the promised savings from energy efficiency investments can address viability and risk gaps by assuring investors of their returns.</p>

	<p>Hedging solutions to offload various risks, including local currency hedging solutions using blended finance solutions to help address foreign exchange risk.</p> <p>Financial structures and business models that favor the low carbon economy through creation of innovative and responsive public-private instruments that incentivize de-risking investments, such as <i>guarantee products</i>, including risk sharing facilities which allow scale up of RE/EE investment in private sector operations.</p> <p>Explore instruments that can help small communities such as guarantees and FiT.</p> <p>Insurance and reinsurance products offer a wide range of products that offset risks associated with climate resilience and adaptation and in some segments of renewable energy supply gap. Insurance products help project developers and lenders in transferring risks and leverage private sources of funding to higher risk projects.</p> <p>Vehicles that fit with institutional investors asset allocation preferences and scale up approach in market segments market where there is need for scale funding.</p> <p>Technical assistance on a programmatic level is key to address macro barriers; however, technical assistance to individual projects remain key to their success and to risk mitigation at the outset.</p>
<p><b>Affordability and Technology Barriers</b></p>	<p><b>Recommendation 3</b> Support by GCF targeting technology and affordability barriers could add great value to developing countries and can stimulate much collaboration south-south and north-south, to reduce barriers, while creating the necessary environment for new and innovative technologies to emerge.</p>
<p><b>Knowledge and Education Barriers</b></p>	<p><b>Recommendation 4</b> To support private sector investment in energy efficiency, it is suggested that GCF support countries to set up and adopt a reporting/monitoring system of energy consumption on the local businesses and industrial operations to provide a base on quantitative assessment of the energy use and cost. This first step could be followed by providing financial support to: (i) set up private public partnerships whereby experts from developed or developing countries can provide technical assistance and build local capacity of local industries and assist in a pragmatic shift, and (ii) provide funding instruments for local businesses to implement necessary capital expenditures and investment in energy efficient operations.</p> <p><b>Recommendation 5</b> A Climate resilience targeted capacity building and awareness program supported by GCF can help support countries to overcome barriers to private investment in climate resilience and adaptation resulting from the knowledge gap: lack of knowledge production, inadequate integration of knowledge, and limited transfer and uptake. GCF could also assist regions and countries, which lack a systematic identification and analysis of the above barriers.</p> <p>Furthermore, the GCF could design interventions to invest in demand growth activities, such as training on climate resilience, insurance, productive uses of energy, supply chains efficiencies, and other</p>

	<p>measure necessary to build demand for private sector services.</p> <p><b>Recommendation 6</b> Sharing information across public bodies and institutions on how national governments and development finance institutions can leverage private investment will be crucial for the private sector, with emphasis on underserved segments such as SME development, women access to finance, and risk capital/innovative startups.</p>
<p><b>Region and Country-related Barriers and Risks</b></p>	<p><b>Recommendation 7</b> Design Power Purchase Agreements and other performance contracts templates, with government-backed guarantees and assurance, which could prove crucial to unlock the long-term debt finance needed to develop large projects and bundle small scale ones.</p> <p>Well-tailored fiscal policies could encourage private sector investment. For instance, in the case of agriculture, with a proposal to tax the production area rather than production volumes or profits, governments can incentivize a more productive land use. This may encourage adoption of new methods and more sustainable and efficient agriculture, achieving higher productivity (yield) per cultivated area.</p> <p>Given the shortage of a pipeline of viable investments for financiers and investors, once policy and enabling environment barriers are addressed, a long-term business skills building locally is fundamental to building investor pipelines. GCF can play key role by designing pragmatic approaches to long-term engagement in supporting building business skills in developing countries.</p> <p>Introduction of sustainability indicators, linking tax rates to sustainable development criteria, which could also reward environmentally friendly behavior.</p>

## Annex I: Glossary

<b>ASSET FINANCE</b>	All money invested in renewable energy generation projects, whether from internal company balance sheets, from debt finance, or from equity finance. It excludes refinancing. The project may or may not be commissioned in the same year.
<b>CAPITAL EXPENDITURE</b>	Funds used by a company to acquire or upgrade physical assets such as property, industrial buildings or equipment. Some investment will translate into capacity in the following year.
<b>FEED-IN TARIFF</b>	A premium rate paid for electricity fed back into the electricity grid from a designated renewable electricity generation source.
<b>GREEN BOND</b>	A bond issued by a bank or company, the proceeds of which will go entirely into clean energy and other environmentally-friendly projects. The issuer will normally label it as a green bond.
<b>INITIAL PUBLIC OFFERING (IPO)</b>	A company's first offering of stock or shares for purchase via an exchange. Also referred to as "flotation".
<b>INVESTMENT TAX CREDIT (ITC)</b>	Allows investment in renewable energy in the US to be deducted from income tax.
<b>LEVELISED COST OF ELECTRICITY (LCOE)</b>	The all-in cost of generating each MWh of electricity from a power plant, including not just fuel used but also the cost of project development, construction, financing, operation and maintenance.
<b>NON-RECOURSE PROJECT FINANCE</b>	Debt and equity provided directly to projects rather than to the companies developing them.
<b>ON-BALANCE-SHEET FINANCING</b>	Where a renewable energy project is financed entirely by a utility or developer, using money from their internal resources.
<b>PRODUCTION TAX CREDIT (PTC)</b>	The support instrument for wind energy projects at federal level in the US.
<b>PUBLIC MARKETS</b>	All money invested in the equity of publicly quoted companies developing renewable energy technology and generation.
<b>VENTURE CAPITAL AND PRIVATE EQUITY (VC/PE)</b>	All money invested by venture capital and private equity funds in the equity of companies developing renewable energy technology.

## Annex II: References

1. African Development Bank (AfDB), Asian Development Bank (ADB), European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IDB), International Finance Corporation (IFC), World Bank Group (WBG). 2016. “2015 Joint report on Multilateral Development Banks’ climate finance”. At: [http://www.eib.org/attachments/documents/joint\\_mdb\\_report\\_on\\_climate\\_finance\\_2015.pdf](http://www.eib.org/attachments/documents/joint_mdb_report_on_climate_finance_2015.pdf)
2. Bloomberg new Energy finance, “Record \$30bn year for offshore wind but overall investment down”, January 12, 2017. At: <https://about.bnef.com/blog/record-30bn-year-offshore-wind-overall-investment/>
3. Climate & Development Knowledge Network (CDKN), “Using blended finance to overcome barriers to climate investments”, By Virginie Fayolle and Serena Odianose of Acclimatise, with Dario Abramskiesh of the Climate Policy Initiative (CPI), January 2017. At: [https://cdkn.org/2017/01/feature-using-blended-finance-overcome-barriers-climate-investments/?loclang=en\\_gb#\\_edn1](https://cdkn.org/2017/01/feature-using-blended-finance-overcome-barriers-climate-investments/?loclang=en_gb#_edn1)
4. Climate & Development Knowledge Network (CDKN), “Addressing the Barriers to Climate Investment”, By Johannes Berliner, Christine Grüning, Karol Kempa, Carola Menzel and Ulf Moslener Frankfurt School – UNEP Collaborating Centre for Climate & Sustainable Energy Finance, November 2013. At: <http://fs-unesp-centre.org/sites/default/files/publications/cdkguidefinancialinstrumentsfinalweb-res3.pdf>
5. Climate Policy Initiative, “Biennial Assessment and Overview of Climate Finance Flows”, November 7, 2016. At: <http://newsroom.unfccc.int/unfccc-newsroom/biennial-assessment-and-overview-of-climate-finance-flows/>
6. Climate Policy Initiative, Global Climate Finance: An Updated View on 2013 & 2014 Flows , October 2016. At: <https://climatepolicyinitiative.org/wp-content/uploads/2016/10/Global-Climate-Finance-An-Updated-View-on-2013-and-2014-Flows.pdf>
7. Economic of Climate Adaptation (ECA) Working Group, “Shaping Climate Resilience Development – A framework for Decision-Making” At: [http://media.swissre.com/documents/rethinking\\_shaping\\_climate\\_resilient\\_development\\_en.pdf](http://media.swissre.com/documents/rethinking_shaping_climate_resilient_development_en.pdf)
8. Germanwatch, By Lutz Weischer, Linde Warland, David Eckstein, Stephan Hoch, Axel Michaelowa, Michel Koehler and Stefan Wehner, “Investing in Ambition: Analysis of the financial aspects in (Intended) Nationally Determined Contributions”, May 2016. At: <https://germanwatch.org/en/download/15226.pdf>
9. Global Adaptation and Resilience Investment Work Group, *Bridging the Adaptation Gap*. At: <https://garigroup.com>
10. Government of Mexico, Mexico Climate Change Mid-Century Strategy, November 2016. At: [https://unfccc.int/files/focus/long-term\\_strategies/application/pdf/mexico\\_mcs\\_final\\_cop22nov16\\_red.pdf](https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf)
11. IEA (2015) World Energy Outlook special briefing for COP 21. At: <http://newsroom.unfccc.int/unfccc-newsroom/iea-says-pledges-for-cop21-slowenergy-emissions-growth-dramatically/>
12. International Renewable Energy Agency, Unlocking Renewable Energy Investment: The Role of Risk Mitigation and Structured Finance, 2016. At: [https://www.irena.org/DocumentDownloads/Publications/IRENA\\_Risk\\_Mitigation\\_and\\_Structured\\_Finance\\_2016.pdf](https://www.irena.org/DocumentDownloads/Publications/IRENA_Risk_Mitigation_and_Structured_Finance_2016.pdf)



13. UN Environment, the Frankfurt School-UNEP Collaborating Centre, and Bloomberg New Energy Finance, Global Trends in Renewable Energy Investment 2017, April 2017. At: <http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2017>

14. UNFCCC, At: [http://unfccc.int/cooperation\\_and\\_support/financial\\_mechanism/standing\\_committee/items/8034.php](http://unfccc.int/cooperation_and_support/financial_mechanism/standing_committee/items/8034.php)

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