

CLIMATE INVESTMENT FUNDS

CTF/TFC.12/4
October 11, 2013

Meeting of the CTF Trust Fund Committee
Washington D.C.
October 28, 2013

Agenda Item 5

DEDICATED PRIVATE SECTOR PROGRAMS

PROPOSED DECISION

The Trust Fund Committee reviewed document CTF/TFC.12/4, *Dedicated Private Sector Programs*, and notes with appreciation the work of the CIF Administrative Unit and the MDB Committee to develop the four proposals.

The CTF Trust Fund Committee approves the following program proposals and requests the MDBs to proceed to develop sub-programs and projects under each program in accordance with the approved *CTF Private Sector Operational Guidelines*:

- a) **[Utility-Scale Renewable Energy:** the objective of this proposal is to catalyze a global funding effort to scale up renewable energy, starting with a focus on utility-scale geothermal energy.
- b) **Risk Capital to Address Regulatory Risks for Renewable Energy:** this program proposes an approach to mitigating regulatory risk for renewable energy projects using a targeted approach to address risks posed by uncertainties arising from a regulatory regime.
- c) **Renewable Energy Mini-Grids and Distributed Power Generation:** this proposal aims to leverage private investment to fill financing gaps and to promote the wide-spread development of renewable energy mini-grids to serve rural and under-served off-grid communities.
- d) **Climate Finance Equity Investments:** this program aims to engage institutional and private equity investors to fill financing gaps encountered in climate change mitigation and low-carbon development.]

The Trust Fund Committee further approves the following indicative allocations of CTF resources to each of the programs, recognizing that there is currently USD 150 million of CTF resources available under the agreed over-programming ceiling. The Trust Fund Committee also recognizes that it may choose to increase these initial indicative allocations should additional resources be made available to the CTF.

.../...

The Trust Fund Committee requests the CIF Administrative Unit and the MDBs to report to the Committee on the progress being made in implementing the proposals at the next meeting of the Trust Fund Committee.

I. INTRODUCTION

1. The CTF Trust Fund Committee at its meeting in May 2013 reviewed a proposal for a global private sector program (document CTF/TFC.11/10), and called for a revised private sector program to be developed for decision at the Committee's meeting in November 2013. The Trust Fund Committee requested the CIF Administrative Unit and the MDBs to elaborate proposals for programs that focus on current CTF pilot countries utilizing 150 million of dedicated existing CTF resources. The Committee further requested the CIF Administrative Unit and the MDBs to develop programs for consideration that could be applied at a regional or global scale and could be financed with new contributions.

2. This paper outlines four detailed proposals for potential private sector programs (hereafter referred to as programs) together with common considerations that would apply to all dedicated private sector programs. Each program proposal includes projects / sub-programs that could absorb the USD 150 million of existing CTF resources in a first phase, to be deployed in selected CTF pilot countries. If additional resources were available, the proposals indicate a potential phasing for expansion of the activities: possibly, first to additional CTF or CIF pilot countries, and then on a wider regional or global scale in other developing countries.

3. This paper does not suggest a prioritization of the proposals, since it believes that the wide range of activities and financing modalities proposed merit guidance from the Trust Fund Committee as to support and level of interest. The Trust Fund Committee is therefore requested to review and endorse those proposals that they wish to see further developed. Once such guidance is received, the CIF Administrative Unit and the MDBs will develop and flesh out selected proposals. The Trust Fund Committee is also invited to determining an indicative allocation of initial funding for each endorsed program proposal. Individual projects or sub-programs developed under any endorsed program will be submitted to the Trust Fund Committee for approval of CTF funding.

II. GENERAL PRINCIPLES AND OBJECTIVES OF THE DPSP

4. The Dedicated Private Sector Programs (DPSP) would have the objective of financing programs or operations that can deliver scale (in terms of development results and impact, private sector leverage and investment from CTF financing) and speed (faster deployment of CTF resources, more efficient processing procedures), while at the same time, maintaining a strong link to country priorities and CTF program objectives. The proposals presented here would deliver impact at scale by enabling the CTF to address existing market failures either through the use of a specific climate finance tool or by supporting the deployment of renewable energy and energy efficiency technologies and mitigation of specific risks. For each proposal, in addition to the Phase I investments, there is an estimate for market demand within other CTF pilot countries and more globally. This estimate is based on MDB assessment of market potential beyond the resource envelope currently available, and is provided to indicate areas where impact could be magnified.

5. The intention is not to replace the current country-driven investment plan model but rather to provide a supplemental pathway through which funds can be more specifically channeled to private sector investments.

6. Similarly, the intent is not to depart from the principles and procedures in effect currently, as applicable to private sector interventions. DPSP proposals would comply with the overall principles and objectives of the CTF, including the results framework. Thus, programs and projects/sub-programs would need to demonstrate:

- a) potential for long-term greenhouse gas emissions savings;
- b) demonstration potential of the activities being proposed;
- c) development impact expected, including co-benefits; and
- d) implementation potential, including targeted private sector leverage expected.

7. Through the results framework, the MDBs would be expected to monitor achievement of results, promote accountability for resource use, and document and disseminate results and lessons learned.

8. The DPSP would make use of a range of financing instruments, which include debt, equity, subordinated structures, guarantees and complementary technical assistance for capacity building. Consistent with the catalytic role of the CTF and with current practice, the DPSP will need to take risks that commercial lenders are not able to bear, and as a result, the programs are likely to be placed in a higher risk position than other financiers. Such positions include subordinated loans or mezzanine tranches of debt, first-loss cover in risk sharing or insurance type products, and equity or seed money for early stage development.

9. The principle of least concessionality will continue to be applied. Each project or sub-program will propose the financial instruments and pricing parameters to be used.

10. At no time would the DPSP have more than 30% of allocated funds committed in a single country so as to ensure a wide geographical reach. The Trust Fund Committee may also wish to consider whether there should be regional concentration limits. Another limitation that could be considered is a funding cap for any one project/ sub-program (for example, USD 50 million).

III. COUNTRY OWNERSHIP AND CONSULTATION PRINCIPLES

11. CTF funding for the DPSP will be deployed in addition to the current country-driven investment program modality. Projects/sub-programs under the DPSP programs will be developed in consultation with, and with the engagement of, relevant public and private sector stakeholders and beneficiaries from the recipient countries. Continued engagement by the MDBs with stakeholders through the normal MDB processes will also aid in ensuring alignment of the projects/sub-programs with country, MDB, and CTF strategies.

12. More specifically, consistency with country priorities and country ownership will be ensured through:

- a) compliance with underlying government policies, strategies, and existing regulatory regime;
- b) consistency with participating MDB's country assistance strategy and appropriate sector strategies and country plans (such as national climate change plan), which are dynamically updated through regular consultation and dialogue with the recipient government and other stakeholders;
- c) alignment with the CTF country ownership principles that promote a country-led approach and integration into country-owned development strategies; and
- d) consultations and engagement by MDBs with the recipient country stakeholders during the design of projects/sub-programs concepts under the programs.

13. Once a program is endorsed by the Trust Fund Committee, the following procedures for country engagement will apply:

- a) the CIF Administrative Unit will inform the CTF focal point of each CTF country of the endorsed program and will invite each country to agree in principle (on a non-objection basis) to MDBs pursuing DPSP activities in the country;
- b) following a non-objection by the CTF focal point, the participating MDBs will design projects/sub-programs concepts consistent with the objectives of the specific endorsed program. For each project/sub-program concept developed, the relevant MDB will engage through the CTF focal point to discuss content of the concept to move forward with the project/sub-program due diligence;
- c) the MDB will carry out due diligence and structuring of the project/sub-program and seek internal MDB clearance;
- d) the CTF focal point can provide any additional inputs at this stage to further guide the MDB in finalization of the project/sub-program;
- e) the project/sub-program will be submitted to the Trust Fund Committee for CTF funding approval. The submissions will include a list of the stakeholder consultations that took place; and
- f) before MDB approval or financial close of any CTF financing facility, the MDB will seek a non-objection from the country (which is part of the normal MDB country engagement and approval procedures).

IV. CTF TRUST FUND COMMITTEE DECISION MAKING

14. Each program proposal and associated preliminary list of ready projects/sub-programs will be submitted to the Trust Fund Committee for endorsement. Four such proposals are annexed to this paper for review and selection. The Trust Fund Committee is also invited to agree on an indicative allocation of CTF resources for the program. Specific projects/ sub-programs under an approved program would be subsequently developed by the MDBs and submitted for funding approval. If the program proposal allocates funds among the participating MDBs, the MDB Committee will keep such allocations under review through the CTF pipeline review process and may agree to reallocate funds among the MDBs based on project readiness. The CIF Administrative Unit will inform the Trust Fund Committee of any reallocation of resources among the MDBs participating in the program.

15. Where a program or sub-program is to be implemented by a single MDB and Trust Fund Committee approval of CTF funding has been obtained, projects to be financed under the program or sub-program would be approved by the Board of Directors of the MDB. The Trust Fund Committee will be notified of each project approved under a single-MDB program or sub-program in accordance with current procedures for private sector programs¹.

16. Regular reporting to the Trust Fund Committee through the CIF Administrative Unit would be the responsibility of the MDBs.

17. The CIF Administrative Unit and the MDB Committee could make recommendations to the Trust Fund Committee on the indicative allocation of funds among the programs in cases of competition for funds or if one program demonstrates that it is disbursing funds and achieving results more effectively than another.

V. MONITORING AND REPORTING

18. Strategic operational monitoring of the DPSP would be the responsibility of the CIF Administrative Unit, in close co-operation with the MDB Committee, based on MDB reporting pursuant to the monitoring guidelines. Tracking of sub-programs for approval and disbursement would be integrated into CTF pipeline management. The CIF Administrative Unit and the MDBs will report annually to the CTF Trust Fund Committee on the progress made in implementing the programs, in accordance with existing monitoring and reporting requirements for CTF. Based on this reporting the program would be assessed against the CTF results framework.

19. The CTF Trust Fund Committee will review the annual reporting on the DPSP and may, if appropriate, decide:

¹ See CTF Financing Products, Terms and Review Procedures for Private Sector Operations, October 24, 2102, Annex B, page 16: *To ensure accountability under the programmatic approach used for private sector projects and as agreed by the Trust Fund Committee, and also to ensure that useful data is available to the Members of the Trust Fund Committee to allow them to exercise their role with respect to private sector projects, MDBs will report to the Trust Fund Committee, at the financial closing of each project (when details of the project are available) on how each project meets the 10 CTF investment criteria.*

- a) on mid-course corrections to dedicated program objectives, criteria, and priorities²;
- b) to redistribute the indicative allocation of funds between programs or agree on new indicative allocations for new or existing programs for application in CTF, CIF or new countries; and/or
- c) to cancel unused funds from the original allocations if the sub-program is not meeting its milestones.

VI. LEGAL IMPLICATIONS

20. For the Trust Fund Committee to have the authority to agree to a new business model for the allocation of CTF resources, such as that proposed in this document, it will be necessary to amend the Governance Framework Document for the CTF (adopted November 2008 and amended December 2011), since the Governance Framework currently only provides for access to CTF financing through country-based investment plans. Specifically, paragraphs 14 and 15 under the section entitled, Country Access to the CTF, could be expanded to allow for use of different programs or business models if the Trust Fund Committee deems them helpful to achieve the objectives of the CTF. This means that, in addition to accessing CTF financing through investment plans (paragraph 14), the Trust Fund Committee could agree to allocate funds in accordance with the agreed governance and decision making of new programs, such as dedicated private sector programs as proposed in this document.

21. If the Trust Fund Committee agrees to proceed with the further development and approval of the DPSP, it will be necessary for the timely launch of the programs that the Trust Fund Committee also recommends the initiation of the amendment process for Paragraphs 14 and 15 of the Governance Framework Document for CTF.

VII. FUNDING

22. For each of the following proposed programs there would be a minimum level of funding below which it would not be effective to pilot the concept. Each proposal identifies the minimum amount of funding that would be required for a meaningful first phase of the program (Phase I) to be implemented in selected CTF pilot countries. All proposals have been designed with the premise that the existing funds are only a start and to take these programs to scale in CTF pilot countries and beyond will require additional funding; however, this paper does not seek ex ante approval for additional funding allocation. If additional funding were made available, the program could be scaled up in other CTF or CIF pilot countries in Phase II and/or expanded on a regional or global basis to non-pilot countries.

² Any mid-term correction would not apply to funds where the relevant sub-project has already passed the first stage of MDB internal approval.

VIII. PROGRAM PROPOSALS

23. The above procedures would apply to any of the dedicated programs, unless the specifics of the proposal call for some modification to the above general principles. In such a case, these modifications are spelled out in the individual proposal concerned.

24. Four program proposals are presented covering a range of investment areas, countries, and regions. Each indicates the MDBs that are interested in pursuing the proposal and the amount of financing requested in the different phases of proposal implementation. As can be seen, taken together, the four requests for Phase I allocations exceed the USD 150 million envelope of resources available for programming, and therefore, all the projects/ programs included here cannot be piloted immediately with the available resources. The Trust Fund Committee is requested to consider and endorse those program proposals which it would like to see further developed and assign priority to the order in which the programs can be developed based on availability of funding. The Trust Fund Committee is also requested to provide any comments on the proposed first projects and sub-programs that could be piloted.

25. To facilitate review, a brief summary of each proposal is presented below, together with a table that shows the salient features of each proposal in summary form (Proposals at a Glance). A detailed elaboration of the individual proposals follows this summary.

IX. UTILITY-SCALE RENEWABLE ENERGY:

26. The objective of this proposal is to catalyze a global funding effort to scale up renewable energy. The program will focus on utility-scale renewable energy which can offer a reliable alternative to traditional fossil fuel base load generation by: (i) mitigating risks that are difficult for the private sector to mitigate; (ii) concentrating efforts on renewable energy technologies that are mature and offer cost reduction potential (through economies of scale, technical improvements, learning effects, etc.); and (iii) focusing on technologies that encompass strong country ownership, being part of country strategies to expand reliable energy supply and access.

27. Geothermal energy is a unique renewable resource with potential to contribute a significant share of affordable and reliable electricity supply in several low and middle-income countries. However, global installed capacity of geothermal electricity generation has reached only 11 GW, a fraction of its technical potential, even if in most countries where it is available it can be a relatively low cost source of electricity – around US¢8 per kWh. This is due to the fact that overcoming the resource risk is a large financial hurdle for geothermal projects.

28. To validate the approach of this program, the program proposes to focus initially on geothermal energy and more specifically on addressing the geothermal resource risk through well drillings. Depending on satisfactory deployment of this program, the program would be expanded to other technologies that satisfy the criteria above (potentially: concentrated solar power, biomass energy) in subsequent phases.

X. RISK CAPITAL TO ADDRESS REGULATORY RISKS FOR RENEWABLE ENERGY:

29. Renewable energy projects are often less attractive than conventional power alternatives. To help level the field and enhance the economics of different renewable energy projects, governments of many countries have enacted various regulatory or policy measures. Yet, while these measures positively affect attractiveness of the investments, they also provide grounds for investors' concerns over the possibility of reversal or revision of such incentives. The perception of regulatory instability or policy reversals restrains investments and undermines the effectiveness of regulatory initiatives. Recent experience in Spain, Bulgaria, and elsewhere has heightened the private sector's regulatory risk perception globally.

30. This program proposes an approach to mitigating regulatory risk for renewable energy projects that does not impose additional financial burden on recipient country governments and that uses a targeted approach to address the risk posed by uncertainties arising from a regulatory regime. The program would seek to use CTF funds as part of the project financing package in a way that would mitigate or cushion the downside triggered by unexpected negative surprises on the regulatory front. Concessionality would only be activated if the regulatory commitments or agreements between the project sponsor and public sector body/entity governing the project were not met.

XI. RENEWABLE ENERGY MINI-GRIDS AND DISTRIBUTED POWER GENERATION:

31. One of the principal challenges to economic growth in developing countries, especially in Africa, Asia and the Pacific, is the lack of access to reliable sources of energy. Approximately 1.2 billion people (17% of the global population) lack access to electricity and 2.8 billion rely on traditional biomass for cooking. It is now widely acknowledged that universal access to energy simply cannot be achieved without decentralized energy solutions.

32. This proposal aims to leverage private investment to fill financing gaps and to promote the wide-spread development of renewable energy mini-grids to serve rural communities and under-served off-grid communities with reliable, affordable and clean electricity and to demonstrate business models that can be replicated and scaled up for wide-spread implementation. This has the potential to spur economic development, spawn employment-generating activities (including both direct and indirect jobs), and improve the social and economic well-being of rural communities including that of women and children who stand to directly benefit from the provision of renewable energy services. While the size of such renewable energy projects is inherently small, the scale up and replication potential is enormous (arguably almost infinite) considering the size of the underserved market segment in the pilot countries.

XII. CLIMATE FINANCE EQUITY INVESTMENTS:

33. Developing countries face a dual challenge of climate change and limited access to energy and other resources. At the same time the annual climate investment gap of around USD 1 trillion necessitates innovative engagement of the private sector if the above challenges are to be met. The Climate Finance Equity Investment program will aim to address this gap and will:

(i) target climate change mitigation technologies with significant potential in terms of greenhouse gas emission reductions; (ii) maximize the mobilization of co-investment for low-carbon development; (iii) increase the supply of renewable energy; and (iv) increase energy efficiency. It will greatly contribute to overcoming a number of barriers faced by private sector institutional and equity investors such as: (i) first-mover risk; (ii) high capital and operational expenditures; (iii) technology risk; (iv) revenue volatility; (v) sovereign risk; and (vi) financing risk.

34. CTF resources will be invested through mezzanine investment and private equity vehicles and will play a catalytic role in leveraging other resources. While the goals of the participating MDBs are broadly the same, each will differ somewhat in how it deploys the resources, due to regional differences, value addition of CTF and needs.

Proposals at a Glance				
	Utility-Scale RE	Regulatory Risk for RE	RE Mini-grids	Climate Finance Equity
Objective	To mitigate drilling risk for geothermal project development	To mitigate regulatory risk for RE projects	To expand energy access via RE mini-grid development	To catalyze private investment in mitigation via private equity
MDBs interested	ALL	ALL	ADB, AfDB, IDB, IBRD	ADB, AfDB and IDB
Phase 1 countries	Chile, Mexico, Turkey	Jordan, Kazakhstan, Morocco, Nigeria, Philippines, Ukraine	India, Philippines, Indonesia	Any CTF country that is a member country of AfDB, ADB or IDB, with limitations for India and China
Other potential countries	Armenia, Columbia, Dominica, El Salvador, Djibouti, Ethiopia, Guatemala, Grenada, Honduras, Indonesia, Kenya, Nicaragua, Philippines, St. Kitts & Nevis, St. Lucia, Tanzania, Vanuatu	Other CTF pilot countries: Egypt, India, Indonesia, Morocco, South Africa, Thailand, Turkey, Vietnam Non CTF Pilot countries: Argentina, Ecuador, Jamaica, and others	SE4All countries including Bangladesh, Colombia, Ethiopia, Ghana, Honduras, Kenya, Nigeria	Tbd based on other MDB interest
Indicative range of funding	Phase 1: \$75-100 million; Phase 2: \$130 million	Phase 1: \$90 million Phase 2: \$150 million	Phase 1: \$35 million (including \$5 million grant) Phase 2: tbd	Phase 1: \$118 million combined for ADB, AfDB and IDB (includes \$3m of preparation grants); Phase 2: tbd
Market failure/barrier being addressed	High resource risk impedes investment	Policy and regulatory risk, real or perceived, impedes investment	Lack of commercial financing for distributed or off-grid RE projects	Lack of private equity financing for sustainable energy

Proposals at a Glance				
	Utility-Scale RE	Regulatory Risk for RE	RE Mini-grids	Climate Finance Equity
Potential market demand	CTF pilot countries: 9 potentially financeable fields over 12-18 months (Phase 1); additional 19 fields in 18-24 months (Phase 2). SREP countries: 12 fields. Others: 10 fields. Total additional capacity = 4GW (current installed capacity = 11GW)	CTF pilot countries that have programs offering RE regulatory support (Phase I may include, among others, Jordan, Kazakhstan, Nigeria, Ukraine).	India: 81 million households; Philippines: 12.9 million people; Indonesia: 25% of the population.	300 RE projects in Africa; 100 investment funds in Asia; 35+ investment funds and 50+ RE/EE projects under evaluation by IDB in Latin America.
Demand likely to be addressed by proposal in Phase 1	2-5 fields	3-5 investments	30 mini-grid investments	AfDB: two PE funds; ADB: CP3 first close; IDB: three to six investments in PEFs and RE/EE projects or programs.
Financial instruments	Contingent loans, equity or quasi-equity; subordinate loans; exploration risk insurance. Support provided directly to the project or through commercial banks or public programs.	Senior and subordinated debt, equity, quasi-equity and other mezzanine financing; all provided on a contingent basis. Support to be provided directly to RE projects.	Loans, guarantees and quasi-equity products. Both direct investments and investments in regional or country-specific impact investment funds may be pursued.	Investment in PE funds via equity and debt; or in a customized mezzanine structure alongside a fund; or direct investment

Proposals at a Glance				
	Utility-Scale RE	Regulatory Risk for RE	RE Mini-grids	Climate Finance Equity
Key stakeholders	Government, private sector, MDBs, bilateral institutions of the UK, France, Australia, Netherlands, Germany	Government, regulatory agencies, private sector project developers, MDBs, other financiers	Energy sector, public and private sectors	PE funds, UK Government
Expected leverage	1:4 or higher	1:20	1:1	1: 28 (AfDB) 1: 73 (ADB) 1:10 to 1:25 (IDB)
Other core indicators	Avoided CO ₂ , new RE capacity, GWh generated or saved	Avoided CO ₂ , MWh generated or saved	Number of households supplied; RE MWh generated; Avoided CO ₂	Avoided CO ₂ , MWh generated or saved; finance mobilized; jobs created; taxes raised
Co-benefits	Capturing and disseminating knowledge; creating momentum to scale-up geothermal investment; expanding opportunities for co-financing; broaden donor reach	Increased perception of policy stability; additional capital attracted to domestic investment; accelerated rate of technology adoption; knowledge and experience in risk mitigation	Improvement in indoor air quality; reduction of black carbon; job creation, training and workforce development; gender and social inclusiveness	Job creation; additional capital attracted to domestic investment; taxes generated; technology and skills transfer

PROPOSAL NAME: UTILITY-SCALE RENEWABLE ENERGY SUB-PROGRAM³

35. MDBs interested in participating: ALL
36. Relevant CTF pilot countries in Phase I: Chile, Mexico, Turkey
37. Other potential countries (Pilot and Non-Pilot): Armenia, Colombia, Dominica, El Salvador, Djibouti, Ethiopia, Guatemala, Grenada, Honduras, Indonesia, Kenya, Nicaragua, Philippines, St Kitts and Nevis, St Lucia, Tanzania, Vanuatu.

A. Program overview

38. The objective of this proposal is to catalyze a global funding effort to scale up renewable energy. The sub-program will focus on utility-scale renewable energy which can offer a reliable alternative to traditional fossil fuel base load generation by: (i) mitigating risks that are difficult for the private sector to mitigate; (ii) concentrating efforts on renewable energy technologies that are mature and offer cost reduction potential (through economies of scale, technical improvements, learning effects, etc.); (iii) focusing on technologies that encompass strong country ownership, being part of country strategies to expand reliable energy supply and access. To validate this approach, the sub-program proposes to focus initially on geothermal energy and more specifically on addressing the geothermal resource risk through well drillings. Depending on satisfactory deployment of this sub-program and availability of additional funds, the sub-program would be expanded to other technologies that satisfy the criteria above (potentially: concentrated solar power, biomass energy) in subsequent phases.

39. Geothermal energy is a unique renewable resource with potential to contribute a significant share of affordable and reliable electricity supply in several low and middle-income countries. However, global installed capacity of geothermal electricity generation has reached only 11 GW, a fraction of its technical potential, even if in most countries where it is available it can be a relatively low cost source of electricity – around US¢8 per kWh. This is due to the fact that overcoming the resource risk is a large financial hurdle for geothermal projects.

40. This proposal aims to be transformational by generating sufficient momentum towards geothermal development that catalyzes investment in the overall value chain (prospective ground studies, test and production drilling, power generation, institutional development, and geothermal development knowledge expansion) and reduces resource risk in select areas and as much as possible, globally. To reach that momentum, this proposal aims to first concentrate a significant amount of available concessional financing towards exploratory drillings in a select number of underdeveloped areas.

41. Due to the modest size of the geothermal industry compared to other renewable energy sources, only a limited number of test drilling projects will be ready to be financed at any given point in time. As a result, only a global scale-up approach can significantly increase knowledge to reduce risks of drilling failures and ensure systematic identification of investments with large environmental benefits.

³ The CTF Committee can suggest an alternative title if deemed necessary.

42. A range of potential financing instruments is proposed. The instrument of choice for each country will depend on the specific nature and modalities for private sector participation in the sector and the opportunities for private sector involvement in the specific investment-ready fields. In some countries, private sector engagement in geothermal development may only take place after test drillings are completed through a public investment and their results used to tender concessions.

43. This proposal builds up on the efforts conducted through ESMAP Global Geothermal Development Plan to validate surface exploration and support the identification and design of individual projects, in active collaboration with multiple other multilateral and bilateral partners. ESMAP has set aside USD 5 million that have started being deployed globally to offer technical assistance to the identification of test drilling investments and to facilitate capture and dissemination of lessons learnt on best practices. The proposal also complements ongoing efforts by several bi-lateral agencies.

44. This proposal is highly relevant for CTF and consistent with CTF objectives to achieve transformation by addressing risks that the private sector is unable to bear. By prioritizing funds towards drilling and geothermal resource validation, the program will enable unlocking the market and scaling up deployment of one of the most cost competitive sources of renewable energy which can provide firm power comparable to traditional fossil fuel based generation.

B. Business Case

Market and barriers to growth

45. To date, global installed capacity of geothermal electricity generation has reached only 11 GW, a fraction of its technical potential. In middle- and low-income countries, insufficient funding has been allocated to validating the availability of commercially viable geothermal resources. Most concessional funding and other support for public and private investments have almost exclusively focused downstream (e.g., 92% of geothermal investments by MDBs over the past three decades have gone towards building steam gathering systems, power plants or geothermal electricity transmission infrastructure). This has resulted in a modest, stop-start expansion of the geothermal energy supply. A country like Kenya, where the geothermal energy resource base is large and promising, has taken years to secure modest geothermal electricity production capacities as development is constrained in large part by the lack of financing for resource validation.

46. Unlike other renewable energy technologies, such as wind, solar, and hydro, it is not possible to validate the geothermal resource with sufficient confidence for commercial development without performing test drillings at depth to assess specific geologic conditions in the field. After completing surface exploration (i.e. geochemical, geological and geophysical), a conceptual model of the geothermal field is developed, which provides a preliminary estimate of the field's potential as well as an indication of where to focus test drillings. Surface exploration represents a small capital expenditure, generally easier to finance than the next stage: test drilling.

47. The objective of the drilling program is to confirm the existence, exact location, potential of the geothermal reservoir and cost to access it (through additional production drillings). These drillings provide the necessary information to (i) firm up the assessment of well productivity, which is largely determined by the flow rate and temperature of geothermal fluids; (ii) assess the cost of drilling a well in a particular reservoir, which is determined, among other factors, by the depth at which the resource is found; and determine the cost to extract geothermal energy from the fluid to be found at depth (the composition of the fluid may impose specific cost to reduce mineral content or capture unwanted chemicals).⁴

48. Typical costs for drilling are in the range of \$3 to 5 million per well. Costs for and the test drilling phase are thus in the order of USD 15-25 million per field, representing at least 10% of the capital expenditure in a new geothermal power plant. This amount covers the cost for drilling 2-4 wells and all associated costs to design, review and independently certify a drilling program. Test drilling costs can significantly vary from field to field and they will also depend on the success rate for the first few wells. The rate of success for test drillings increases with the numbers of wells drilled.⁵ The total production drilling cost is usually around 30% of the total development cost

49. The combination of relatively high capital requirements, high uncertainty of this phase, and time taken to complete this resource validation phase, about 3 years, deter commercial investors.⁶ International experience shows that the resource confirmation stage generally takes place with some kind of public financial support for test drillings, and/or with the use of shareholders equity, thus constraining the growth of the geothermal sector as such funding options are scarce, and expensive.⁷

50. The technology to produce electricity from geothermal sources is mature. After being able to confirm the geothermal energy potential of a given geothermal field with the required level of certainty, geothermal has a similar risk profile to many other power generation technologies, with relatively high upfront costs and comparatively low costs of operation and maintenance. Furthermore, the power plant technology is comparable to any other steam driven power plant like coal power plants and is therefore proven and financeable.

⁴ For example, the difference between drilling to a depth of 2.5 km instead of 2 km for full size wells may translate into an additional cost in excess of USD 1 million per well (ESMAP, 2012, *Geothermal Handbook, Washington*).

⁵ IFC, 2013, *Success of Geothermal Wells: A global study*, Washington. For example, in Turkey in 2008-2012, the rate of success of 200 wells drilled for resource confirmation and production has exceeded 80%. However, in a completely new area, this rate of success would be lower, generally under 60%.

⁶ Resource validation includes three phases: 1- preliminary survey, 2- surface exploration, and 3- test drillings (including drilling, well testing, reservoir modeling). Phases 1 and 2 take 2 years approximately, while phase 3 would typically take 1 to 1.5 years. The proposed program would only support projects that have completed phases 1 and 2 and that are ready for or already in the drilling phase, which would also reduce the disbursement period.

⁷ In all countries where private sector has invested in geothermal power production, governments have provided support to mitigate some of the initial resource risk through instruments such as: direct funding or cost-sharing of exploratory wells (eg.: Indonesia, Australia, Japan, Kenya, Russia, Turkey, United States), performing wellfield development for build operate and transfer power plants (ex.: Costa Rica, Guatemala, Philippines), providing loan guarantees (eg.: United States), or subsidizing reservoir insurance (eg.: Germany). See PPIAF, 2010, *An Assessment of Geothermal Resource Risks in Indonesia*, Geothermex for the World Bank, Washington.

51. Once the geothermal resource has been proven to a level that allows commercial financing for steam field development and power plant construction, the profile of returns on investment is similar to that of other base-load power generation sources (minus the variability of fuel cost associated to fossil-fueled power generation). This is the reason why investors are interested in the geothermal sector when they can overcome the financial hurdle faced in the early drilling stages.

52. The returns relative to other sources of electricity generation will depend on a country's available alternatives and regulatory framework to value positive environmental externalities. As for any other generation project, developing a geothermal power project requires that the resources involved be economically justified (i.e. the project becomes part of the least-cost development plan). The economics of the different resources will be compared based on their levelized cost of electricity generation. Despite its high up-front costs, geothermal is often competitive and complements other sources of electricity generation given its high capacity factor.

How Proposal will address barriers

53. *Lessons learnt from experience:* To date, there have been two significant programs to address the resource risk. They were both implemented by the World Bank, with the Global Environment Facility (GEF) as the contributor of concessional capital. First, the GeoFund had a total capitalization of USD 25 million for risk mitigation and technical assistance (TA)⁸ and was closed in 2009 after several years of activity in Eastern Europe. Second, ARGeo (African Rift Geothermal Development Program) whose capital consisted of USD 11 million for risk mitigation – a component which was dropped in 2012 after 10 years of preparation – and USD 6.75 million for TA (executed by UNEP). Six countries – Ethiopia, Eritrea, Djibouti, Kenya, Uganda, and Tanzania – were eligible to receive support from the program. These programs failed to trigger a large and sustainable development of geothermal development mainly because they lacked capital to mitigate the individual risk of failure of test drilling projects but also because they lacked the geographic span to allow for risk diversification across a sufficiently large number of projects.

54. Recognizing the needs in some specific areas for more funding to address the resource risk, several bilateral donors have created facilities to provide insurance to guarantee the risk of drilling failures. One example is KfW's Geothermal Risk Mitigation Facility (GRMF) for Eastern Africa,⁹ which has about USD 71 million available to provide grants for surface studies aimed at well siting, for the drilling of exploratory wells and, on a contingent basis, for subsequent exploration or appraisal wells. The GRMF is currently evaluating applications for its first round of proposals and received a number of application exceeding expectations. Through

⁸ The first phase of the Geofund included two subprojects: (a) a grant of US\$ 810,000 to the International Geothermal Association for Regional Technical Assistance (TA) activities and (b) a Geological Risk Insurance (GRI) Grant of US\$ 3.72 million to MOL, the Hungarian integrated oil and gas company group. In the second phase, US\$ 1.5 million was allocated for TA in Armenia, and US\$ 10 million was allocated to the IFC for geothermal development projects involving the private sector in Turkey. The remaining US\$ 9.5 million was returned to GEF. The \$10 million for Turkey are currently being managed by IFC for the deployment of an Exploratory Risk Insurance facility in partnership with MunichRe.

⁹ Eligible countries for the first round included Ethiopia, Kenya, Rwanda, Tanzania and Uganda. For the second round, the list has been extended to Burundi, Comoros, Djibouti, Democratic Republic of Congo, Eritrea and Zambia.

close collaboration with KfW, this sub-program will explore how to further leverage the GRMF resources further. More specifically, the DPSP sub-program could support test drillings in sites where the GRMF has financed surface studies, as well as in sites where GRMF's support is not sufficient to leverage enough capital to fully finance the test drilling operation. Moreover, individual project proposals will have to be additional to activities already being supported by other donors. It is important to note, however, that current or planned donor support to geothermal energy projects seldom addresses the issue of limited financial resources for the geothermal resource confirmation phase (including in cases the production drilling phase, when there may still be significant residual resource risk). There is therefore a strong case for support by this proposal even in circumstances where other contributions from donors are already planned.

55. Several key lessons from international experience, including the GEF and the current support to geothermal development from the CIFs, point to the need for a larger critical mass of well-targeted concessional funding:

- a) Per unit of concessional funding, an increased focus on resource assessments (i.e. support to drillings expenditures) leverages larger investments in geothermal energy than downstream one-off investments in power plants;
- b) In low and middle income countries, risk insurance instruments are unavailable in some cases or insufficient and direct financing of resource assessments is indispensable to large scale development given the constraints on capital availability;
- c) Unless highly concessional loans are made available and significantly alter the risk/reward ratio of the exploration, lending needs to be combined with other risk sharing instruments (e.g. guarantee schemes, insurance);
- d) Given the large unit cost of individual resource assessments per field, allocating the costs (and the results) across a larger number of donors is a more effective way to expand the pipeline of downstream investments; and
- e) To reduce the risk of drilling failures, maximizing learning effects through knowledge dissemination within and across countries is indispensable and can only be achieved if the global volume of drillings increases sufficiently to induce a sustained growth of the geothermal industry globally.

56. As said earlier, given the lack of commercial debt for geothermal resource validation or even production drilling with significant residual resource risk, most of the international geothermal development experience shows that the upstream phases of development inevitably rely strongly on public sector role, with private developers entering the project with commercial funding at more mature phases (i.e. when resource risk has been significantly reduced).

57. To mobilize additional capital, there is increasing interest by governments of countries where geothermal resources are present in deploying instruments that facilitate private sector

engagement in the upstream phases of project development. In parallel to a large number of concessions having been offered to private developers in multiple countries, such instruments include direct support to investments as well as guarantee and insurance schemes. Direct support and guarantees schemes have proven successful in attracting private investors to the test drilling phase in countries where significant geothermal electricity capacity has been developed (e.g.: US, Japan, Iceland). The large-scale deployment of such instruments in developing countries will require support from donors and IFIs.

58. *Longer-term vision.* The reality of geothermal development is that some amount of public support, both to the public and private sectors, is necessary as long as the knowledge of deep geological structures remains poorly understood. However, as more and more areas get explored, the need for direct support decreases and does not require continuous replenishment. The resource risk decreases thanks to the accelerated reduction in the rate of failures through learning, as observed when drilling activity grows, as well as from technological improvements over time.¹⁰ The need for concessional funding will also decrease in the long run proportionately to reductions achieved in unit drilling costs that accompany a scale up of drilling activity.

Market size potential

59. Current installed geothermal power production capacity is around 11GW. The proposal has an indicative potential to unleash 4GW of additional geothermal electricity capacity (see Annex). An indicative inventory of fields for CTF support has been put together based on an inventory of investment-ready sites recently completed by Iceland GeoSurvey (ISOR) for the World Bank Group’s led Global Geothermal Development Plan and on communications with different donors. The table below describes the different fields, organized in groupings to facilitate proposal review.

Table 1: Indicative project and country pipeline

	Description	Total number of fields	Countries
Group 1	Fields in CTF pilot countries potentially financeable in 12-18 months	9	Chile, Mexico, Turkey
Group 2	Fields in CTF pilot countries potentially financeable in 18-24 months	19	Colombia, Mexico, Indonesia, Philippines
Group 3	Potentially financeable fields in SREP countries	12	Kenya, Ethiopia, Tanzania, Vanuatu, Armenia
Group 4	Potentially financeable fields in non-CIF countries	10	El Salvador, Guatemala, Dominica, Nicaragua, St Kitts and Nevis, St Lucia

Source: WBG

¹⁰ IFC, 2013, *Success of Geothermal Wells: A global study*, Washington.

NOTE: This list of countries is only indicative, others may be identified or become ready in the medium term. Examples are Peru, where JICA has recently completed a nationwide geothermal power development plan, which includes a preliminary appraisal of geothermal resource potential in promising fields; Grenada, where early surface exploration has indicated the possibility of hot geothermal fluids; and Honduras, where a private developer has recently signed a PPA with ENEE, the public utility.

60. The Annex contains the complete list of indicative fields by group, presenting their stage of development; estimated potential, when available; and estimated drilling costs.¹¹ The development stage indicates whether a field (1) needs additional surface exploration, (2) has sound surface exploration but limited or no exploratory drilling, and (3) has had its resources confirmed by exploration/test drilling but further exploration/appraisal drilling is necessary. Fields in stages (2) and (3) would be the primary focus for test drilling support during the first phases of the DPSP, while fields currently in stage (1) could move to stage (2) in the medium term if surface exploration is completed.¹²

61. Countries have been grouped based on CTF's requirements for fast disbursement and for an initial focus on CTF-pilot countries. However, these groups are not meant to indicate sequential development. The actual sequence in which investments happen and fields are developed will depend on availability of funds; decision by the CTF Sub-Committee to expand the DPSP sub-program to non-CTF and, potentially, non-CIF countries; and readiness of fields to move into the test drilling phase.

C. Proposal Terms and Implementation Strategy

Financial instruments to be used

62. The risks involved in geothermal development are multiple and high (resource, regulatory, operational). A number of those risks can be mitigated through quality preparation and supervision of projects. However, there exists a high residual level of risk that cannot be entirely mitigated, and will inevitably result in potential losses. The only viable approach to enable a transformational geothermal scale-up is to focus a critical mass of support to address the main financial hurdle of a large number of projects.

63. The project funding mechanisms to be supported under this sub-program are foreseen to be flexible, and would be further developed during specific project preparation. However, the general principles that would be followed include minimum concessionality for use of donor funding, interventions to risk/return ratios through upfront grants/concessional grants or other

¹¹ Total estimated costs have been calculated by adding to the estimated drilling cost: 15% for preparatory civil works/associated infrastructure, 5% for technical assistance and 10% for contingencies. Issues over land rights have not been specifically addressed or costed in the proposal since these are expected to be country and project specific. However, land rights will have to be carefully assessed for each particular investment during project preparation to ensure compliance with relevant country's regulation as well as donors' policies.

¹² Availability of drilling rigs and drilling professionals is known and assessed as sufficient. Although it is a small industry, without a large excess supply, the DPSP is unlikely to trigger drilling services shortages at project level that could slow down implementation. Availability of trained drilling professionals and rigs will depend on the current status of geothermal development in a particular country. In countries with significant drilling activity, national and international professionals and rigs are more likely to be readily-available, while countries with limited activity may face longer lead times and mobilization costs securing personnel and equipment. During preparation of each project, a detailed assessment has to be carried out on potential availability of drilling contractors and qualified personnel, so that the most appropriate management, contracting and procurement structure is put in place for sound risk management and successful execution of a specific drilling program.

financing modalities, including risk sharing mechanisms, related to geothermal resource development to increase private sector investment flows, with a key emphasis on investment readiness (including enabling environment conditions and sponsor activity) for projects in the pipeline.

64. Project or country specific instruments targeted at the private sector could include:

- a) Direct financial support to private sector concession holders. These could include: (i) contingent loans (i.e. loans convertible to grants in case of drilling failure); (ii) equity or quasi-equity with the upside of potential gains; (iii) risk mitigation schemes such as cost-shared drilling schemes which include the option of the conversion to an equity stake in the project under a pre- agreed pricing formula that reflects the risk assumed by the development funding institution/government entity. Overall tenor/exit of 10 years appears reasonable (i.e. 7-8 years after production starts).
- b) First loss guarantees to commercial banks or to public sector facilities established to provide risk mitigation to private developers. CTF funds would be used to mobilize existing financial sector liquidity while providing a “risk cushion” to financial institutions or to a public facility. The guarantee would be contingent finance that is callable cash, and as such, count as Tier 1 capital, and would not require a government counter-guarantee. Commercial banks or public facilities would share risks to a pre-defined maximum, to create an incentive for thorough due-diligence of projects by the financiers and reduce the risk of moral hazard.
- c) Exploration Risk Insurance. To reduce financial exposure to resource productivity risk, CTF funds could be used to buy-down the cost of the premiums charged to insure the thermal output of the reservoir. Success criteria as well as conditions for payout would be pre-defined for this particular instrument.
- d) PPP for exploratory drilling: In cases where private sector is not in a position to put a large share of the required equity at risk for test drilling, even with risk mitigation instruments in place, a portion of the funds may be used for the early test drilling by public sector to locate the resources as long as there is a clear arrangement in place to transfer additional drilling risk (i.e. drilling additional wells required for resource confirmation and reservoir modeling) to private investors.¹³

65. The financial instruments proposed above are indicative. The final choice of instrument for a particular project / country will depend upon the status and nature of ongoing developments in this country. For instance, in countries where availability of capital is highly constrained, guarantee or insurance schemes will not be enough to spur activity in the early drilling phases, so

¹³ For example, in Turkey, the government’s Mining Authority has a mandate to explore for geothermal energy. The Authority apply to licenses to perform exploration investments in new areas where the resource risk is therefore the highest. However, the Authority has no mandate to produce electricity. Once it has completed some exploration, under the same licensing arrangements that apply to all developers (public and private), it has to tender out the licenses to private developers.

direct financial support will be required. For countries where rights to explore for geothermal energy has already been allocated to private developers, instruments such as credit lines managed by local banks could be favored. For countries where public sector still plays an important role in investing in the early stages of geothermal resource validation, the proposal could favor the PPP solution. Allocating support from this proposal to projects will not only remain flexible, but will also apply principles of simplicity and robustness of the proposed instruments with a view to minimize transactions costs, design delays and moral hazard (eg. moral hazard can occur in complex risk sharing schemes that rely on measures of success or failure that can be disputed).

66. Maximizing learning effects through knowledge capture and dissemination is considered as one of the main co-benefits of the current proposal.

Key stakeholders and implementation strategy

67. All MDBs as well as several bi-laterals¹⁴ have expressed interest in the proposed sub-program, while initial dialogue with potential recipient countries concerned shows strong interest. The involvement of CTF operational focal points, and governance and decision making will follow the general procedures outlined in the main text.

68. To avoid harming ongoing national or regional initiatives (cherry picking projects) the DPSP will work with them on a complementary basis, meaning that the national program or the MDB involved shall operate as the implementing agent and DPSP resources will top up existing programs and be deployed under the same guidelines and conditions as the local program.

D. Results Framework

69. *Core indicators.* In addition to project success indicators that track validation of the resource base, the leverage achieved by the donor funds, and the ability of the project to achieve financial closure, core indicators relevant to CTF include: volumes of GHG avoided and MWh generated. These have been estimated below based on current estimated generation potential for the fields in the indicative list (see Annex for details). Table 2 below summarizes the estimated targets by group of projects:

Table 2: Core indicators*

Core indicators		Group 1	Group 2	Group 3	Group 4	TOTAL
Avoided CO ₂ emissions (million tCO ₂)	per year	1.8	4.4	3.6	2.6	12.5
	lifetime (30 year cumulative)	54	132	109	78	374
New RE capacity (MW installed)		525	940	2,298	692	4,455
Additional power generation (GWh/year)		4,139	7,410	18,177	5,455	35,123
Leverage from CTF Funds		1:4-1:6				

*Estimated targets include fields in all the three development stages (1-3 - i.e. test drillings have not been completed). Fields for which no information was available on estimated generation capacity have been assigned a 50 MW potential for the purpose of estimating the core indicators.

¹⁴ Government of the United Kingdom, France, Australia, Netherlands, Germany, among others.

70. *Co-benefits.* Co-benefits include: (i) capturing and disseminating knowledge across a wide range of countries, enabling a global community of practice to emerge, providing comfort and expertise to investors by developing a track-record of successful projects;¹⁵ (ii) creating momentum to scale-up investments in geothermal and expand the geothermal industry through drilling, securing a larger market for geothermal equipment sales; (iii) helping donors to articulate their development objectives, expanding opportunities for co-financing and parallel financing for individual resource assessment projects; and (iv) helping to broaden the reach of donors, complementing country level or regional efforts (such as KfW’s GRMF for East Africa).

E. Consistency with CTF investment criteria

CTF Investment Criteria	Sub-Program Compliance
Potential GHG Emissions Savings	Avoided emissions for the indicative pipeline are shown in Table 2. It is important to note that this sub-program will only be an enabler for future emission reductions as no such reductions will directly result from drilling activities.
Cost-effectiveness	Based on CO ₂ emissions reductions estimates assumed levels of financing under Phase I of the sub-program, the cost of reducing a ton of CO ₂ would be USD 1.38.
Demonstration Potential at Scale	<p><u>Knowledge dissemination:</u> capture and dissemination of knowledge on successful models and instruments for private sector involvement in upstream geothermal development; cross-fertilization of experiences across CIF programs; potential for further scaling-up, since numerous SREP eligible countries are making efforts to scale-up on geothermal energy .</p> <p><u>Reduction of costs through expansion of the geothermal industry:</u> increased geothermal drilling has the potential to reduce drilling costs if it stimulates construction of new rigs that will be available for rental; cost reductions due to learning effects that will accompany expansion of drilling activity.</p> <p><u>Improvement of industry practices:</u> enhanced standards through use of the MDB’s procurement, environmental and social standards and the stimulation of good drilling practices will improve the industry’s reputation, helping to generate public support for the technology as a reliable and clean energy source;</p>
Development Impact	<u>Increased supply and reduced costs.</u> increased generation of electricity to address growing demand, with potential to reduce levelized costs geothermal will be below the alternative fossil-fuel baseload technologies; reducing investors’ risk perception will lower risk premiums for debt and capital, thus helping to further reduce the required levelized tariff for geothermal.

CTF Investment Criteria	Sub-Program Compliance
	<u>Local benefits.</u> Reduction in emissions of local pollutants where geothermal plants displace fossil-fueled generation, especially coal; <u>potential generation of jobs during construction and plant operation</u>
Implementation Potential	Implementation potential will vary by country depending on the public policies and institutions in place for support of geothermal development, as well as on the presence of interested and experience private sector developers and sponsors. Countries that already have supportive policies for attracting private investors are likely to develop projects faster. However, it is expected that the projects supported under the sub-program include some component of technical assistance for capacity building and advisory services, which would also help address specific regulatory and institutional barriers.
Risks	<p><u>Program risks:</u></p> <ul style="list-style-type: none"> • Co-financing for projects does not materialize • Projects take longer to prepare and implement, slowing the expected disbursement rate. • The country environment is not conducive to development of drilling projects due to specific regulatory and sector organization barriers • Test drilling projects conclude to insufficient productivity of wells to ensure availability of commercial geothermal resource. The proposal seeks to diversify the risk across a large number of diverse fields and areas. • Successful test drilling projects do not advance to the production stage due to high levels of regulatory risk that limit the appetite for private sector engagement. <p><u>Project risks.</u> Specific implementation, financial, social or environmental risks will be identified for each particular country and project at the time of preparation.</p>

F. Funding

71. Funding needed to launch the sub-program (Phase I) will require about USD 75-100 million, which will include technical assistance funds for capacity building and advisory services. This funding would focus on Group 1 projects. Depending upon the availability of additional funds, the sub-program could be scaled up to other countries belonging to the three other groups based on the application of the CTF core indicators and readiness criteria. The program could deploy an estimated additional USD 130 million in the Group 2 countries and an estimated additional total of USD 155 million in countries on Groups 3 and 4. These figures show that there is strong demand for resources that Phase I will not be able to satisfy given the funding constraint.

72. Resources under this Sub-program will be made available on a first-come, first-served basis. Flexibility will be allowed so that projects in eligible countries that are ready to move into

or are already in the drilling phase will be considered first. Due diligence on the appropriateness of the regulatory framework will be carried out on a case-by-case basis once projects or programs are presented for consideration. There are ongoing efforts by multilateral development banks in all countries listed in Annex to help design geothermal development projects that encompass efforts to validate geothermal resource through drilling.

ANNEX
INDICATIVE PROJECT PIPELINE

[NOTE: others fields or countries may be identified or become ready in the short to medium term]

CTF country	Site	Stage of development*			Estimated potential (MW)	Estimated drilling cost (US\$million) †	Estimated emission reductions (tons CO2/year)
		1	2	3			
GROUP 1 - Indicative list of potentially financeable fields in 12-18 months (CTF pilot countries)							
Chile	Puchuldiza			x	75	30	242,433
Chile	Tinguiririca		x		50	30	161,622
Chile	Laguna del Maule			x	50	30	161,622
Chile	Tolhuaca			x	50	30	161,622
Mexico	Nuevo Leon Ejido		x			11	179,361
Turkey	Aydin-Umurlu		x		100	11	362,664
Turkey	Denizli-Tekke Hamam		x			11	181,332
Turkey	Manisa-Alasehir			x		11	181,332
Turkey	Manisa-Salihli		x			11	181,332
GROUP 2 - Indicative list of potentially financeable fields in 18-24 months (CTF pilot countries)							
Colombia	Tufino-Chiles-Cerro Negro	x				18	69,379
Colombia	Volcan Macizo Ruiz		x		80	18	111,007
Mexico	El Ceboruco-San Pedro	x				11	179,361
Indonesia	Jailolo	x			40	18	223,590
Indonesia	Wai Sano	x			50	18	279,488
Indonesia	Tulehu		x		40	18	223,590
Indonesia	Atadei	x			40	18	223,590
Indonesia	Matalako Flores Island			x	40	18	223,590
Indonesia	Sokoria Flores Island		x		20	18	111,795
Indonesia	Atadai Lambata Island		x		20	18	111,795
Philippines	Mt. Cagua-Baua, Cagayan			x		18	279,488
Philippines	Batong-Buhay, Kalinga		x		150	18	568,831
Philippines	Daklan, Benguet			x	60	18	227,532
Philippines	Mt Natib, Battan			x		18	189,610
Philippines	Mabini, Batangas		x			18	189,610
Philippines	Montelago, Mindoro Oriental		x			18	189,610
Philippines	Mt. Labo, Camarines Norte			x		18	189,610
Philippines	Biliran, Biliran Province			x	125	18	474,026
Philippines	So. Leyte			x	85	18	322,337
GROUP 3 - Indicative list of potentially financeable fields in SREP countries							
Kenya	Longonot (3)		x		600	18	1,296,130
Kenya	Silali (3)		x		1000	18	2,160,216
Ethiopia (1)	Aluto-Langano			x	75		
Ethiopia	Corbetti (3)		x		500	18	27,594
Ethiopia	Tendaho (3)	x				18	2,759
Ethiopia	Gedemsa	x				18	2,759
Ethiopia	Dofan (4)	x				18	2,759
Tanzania	Mbaka		x		10	18	25,938
Tanzania	Ngozi	x			25	18	64,846
Tanzania	Rufigi	x			5	18	12,969
Armenia (2)	Karkar		x		30		
Vanuatu	Efate		x		8	30	49,133

CTF country	Site	Stage of development*			Estimated potential (MW)	Estimated drilling cost (US\$million) †	Estimated emission reductions (tons CO2/year)
		1	2	3			
GROUP 4 - Indicative of potentially financeable fields of non-CIF countries							
El Salvador	Chinameca			x		11	87,907
Guatemala	San Marcos	x			37	11	83,428
Guatemala	Tecuamburro	x			50	11	112,741
Guatemala	Zunil II			x	45	11	101,467
Guatemala	Cerro Blanco			x	50	11	112,741
Dominica	Wotten Waven			x	120	11	736,996
St Kitts & Nevis	Charlestown			x	35	11	214,957
Nicaragua	Volcan Telica - El Najo		x		60	18	217,598
Nicaragua	Volcan Casita - San Cristobal		x		225	18	815,994
St Lucia	La Soufriere-Qualibou Caldera	x			20	18	122,990

Source: *Inventory of Investment-Ready Geothermal Sites*, June 2013, prepared by the Iceland GeoSurvey (ISOR) for the World Bank Group Global Geothermal Development Plan; and communications with donors.

(1) World Bank and others have already committed financing for production drilling at Aluto-Langano, so this field would not, in principle, require additional financial resources (project currently under preparation)

(2) Test drilling for the Karkar site in Armenia is being considered for support under the SREP IP currently being prepared, so this field has not been included in our calculations for financing resources and emission reductions.

(3) Application under review for KfW-AUC GRMF grant support for drilling. Suswa (Kenya) and Kinigi (Rwanda) are also in the list of initial sites for which support has been requested from the GRMF - decision expected by Aug 2013. For the Tendaho site in Ethiopia, AFD is expected to contribute co-financing of 15-20 million Euros.

(4) Application under review for KfW-AUC GRMF grant support for surface studies - decision expected by Aug 2013

(5) Communication with project sponsor indicated that funding for production drillings and plant construction is already partially secured, so this field has not been included in our calculations.

KEY

* Stage of development

#1	Validation on available surface exploration needed/ additional surface exploration needed
#2	Sound surface exploration but limited or no exploration/ test drilling
#3	Resource confirmed by exploration/ test drilling - further exploration/appraisal drilling necessary

†Average cost of drilling (million US\$)

Costs have been assigned based on estimated drilling difficulty by country, numbers will

Test drillings (Stages: #1, #2, #3)*

Drilling difficulty		
High	H	30
Medium	M	18
Low	L	11

* For 3 to 5 drillings with variable depths and diameter, from slim hole to full-size production

NOTE: These drilling cost estimates do not include provisions for civil works, technical assistance and contingencies.

‡ Estimated emission reductions

Calculated using (grid) emission factors for electricity generation in *CO2 Emissions from Fuel Combustion: Highlights. IEA, 2012 (p.111)*. Numbers for emission reductions will be underestimated since, in many countries, geothermal

Assuming 90% capacity factor for geothermal

For Vanuatu, Dominica and St Lucia: no information available - used world average emission factor for oil

For sites for which no info on estimated capacity was available, 50 MW has been used for

PROPOSAL NAME: RISK CAPITAL TO ADDRESS REGULATORY RISKS FOR RENEWABLE ENERGY

73. MDBs interested in participating: ALL
74. Relevant CTF pilot countries in Phase I: All CTF Pilot Countries are eligible. In particular, the focus countries will be Jordan, Kazakhstan, Nigeria, Morocco, and Ukraine.
75. Other potential countries (Pilot and Non-Pilot) in Phases II and III: All CTF Pilot Countries for Phase II and all eligible non-Annex I countries for Phase III.

A. Program overview

76. Renewable energy projects are often less attractive than conventional power alternatives. To help level the field and enhance the economics of different renewable energy projects, governments of many countries have enacted various regulatory or policy measures. At the same time, governments, when setting policy, have to consider wider policy objectives, such as maintaining affordability of energy tariffs, and/or competitiveness of electricity-dependent industries. Therefore, while the support measures positively affect attractiveness of the investments, their inherent vulnerability to policy change provides grounds for investors' concerns over the possibility of reversing or revising such incentives. The perception of regulatory instability or policy reversals restrains investments and undermines the effectiveness of regulatory initiatives.

77. Research and empirical evidence indicate that one of the most important criteria affecting attractiveness of a certain jurisdiction for renewable energy investments is the stability of the policy environment. Moreover, when assessing attractiveness of investments, renewable energy developers rate regulatory governance aspects as equally important as specific regulatory policies, and more important than operational factors.¹⁶ Recent experience in Spain, Bulgaria, and elsewhere has heightened the private sector's regulatory risk perception globally. The risk perception was especially affected in countries where various policy and regulatory measures and incentives had already been perceived as unsustainable in the long-term. This increased risk perception, in addition to existing perceived political risks for a country, has had a dampening effect on the appetite of the private sector to develop renewable energy projects.

78. This program proposes an alternative approach to mitigating regulatory risk for renewable energy projects that does not impose additional financial burden on recipient country governments, and uses a targeted approach to address the risk posed by uncertainties arising from a regulatory regime. The program would seek to use CTF funds as part of the project financing package in a way that would mitigate or cushion the downside triggered by unexpected negative surprises on the regulatory front. The key element here is that the concessionality would only be activated if the regulatory commitments or agreements between the project sponsor and public sector body/entity governing the project were not met. However, each MDB will differ in how to structure and deploy the CTF resources, due to regional differences and project needs, while the objectives of this program are still fulfilled. Further, the CTF regulatory

¹⁶ Holburn, G.L.F., Regulatory Governance and Policy Risk: Attracting Private Investment in (Renewable) Energy, Ivey School of Business, 2010. http://www.thinkingpower.ca/PDFs/Governance/1_1_Holburn.pdf

risk capital might be used in combination with certain political risk insurance instrument (such as those provided by MIGA) to ensure the effective use of capital and thorough coverage.

79. This program would undertake a project-based approach and MDBs would need to ensure appropriate alignment of interests between all parties in the project, including the relevant government entity, to minimize moral hazard. The presence of an investor such as one of the MDBs in the transaction would leverage country and sector relationship, which in turn would help better understand the regulatory environment and reduce the risk of moral hazard. It will also provide some necessary comfort to ensure crowding-in senior lenders, including MDBs own financing and third party risk capital. Additionally, depending on the type of the instrument used, the CTF capital may be structured in such a way as to ensure that the equity sponsor is also exposed to a certain level of regulatory risk (for example, through the cash waterfall features). This arrangement will allow CTF funds to benefit from the knowledge, experience, and judgment of the local equity partner, leveraging its understanding of all project risks, including instability of regulatory environment.

80. Initially, the program (Phase I) may pick countries with high perceived likelihood of retroactive reversal of regulatory incentives and strong presence and track record of involved MBDs. The country selection criteria will be further refined and may be flexible enough so as to help identifying countries where the regulatory risk mitigation instrument can be used most effectively and can lead to the most significant impact, triggering substantial increase in the investment volume. The initial set of countries may include the ones that have large and growing exposure to renewable energy not fully supported by corresponding budgetary resources, or the ones with aggressive policies in place but limited track record.

81. As noted earlier, the MBDs in the transaction would need to ensure proper alignment of interest in the structure among all the stakeholders to limit moral hazard potential. This alignment would need to take account of the level of support given in a particular country, which would need to be assessed against affordability/competitiveness criteria, e.g. by analyzing the overall impact that specific growth scenarios for renewables would have on electricity tariffs in the future. More detailed analysis of the potential alignment as well as MDBs implementation capacity will be provided at the sub-project level which will be brought to the TFC for approval.

B. Business Case

Market and barriers to growth

82. Growth in the renewable energy sector has been driven by various forms of support from national governments over the past decade. This support has come in the form of financial measures or market-based instruments that strengthen the economics of projects by enhancing revenue streams (FiTs or other arrangements providing preferential tariffs) or predictably alleviating the burden of expenses. Sometimes, however, these measures, while improving viability and bankability of projects, have also injected some uncertainty over the stability and longevity of the policy measures. This uncertainty often leads to an increase in the risk perception of capital providers, therefore, increasing the cost of capital, and in some cases potentially offsetting the positive effects of the support. Fears of possible regulatory instability

are often amplified in the context of scarcity of long-term financing, and lead to decisions to not develop the project.

83. The proposed program recognizes that substantial additional risk is “induced” by the expectation of policy/regulatory instability and aims to reduce its influence. The program is expected to help protect investments against non-commercial risks and to help investors obtain access to funding sources with better financial terms and conditions.

84. The primary target market segment is green-field utility-scale renewable energy projects in countries with enacted regulatory or policy measures for renewable energy technologies. One of the subcategories may include energy generation projects structured with the use of PPAs with long-term preferential structure, FiTs, or other forms of offtake agreements. Another subcategory might be comprised of projects that explore long-term government measures that create cost advantages (such as specific tax holidays or accelerated depreciation allowances). The program would be flexible enough to accommodate some other regulatory measures.

85. A mix of renewable energy technologies would be considered with priority given to the technologies that could be most affected by the potential changes in the regulatory environment. Caps on the amount of CTF funding (expressed as a portion of overall project costs) for different types of technologies could also be introduced in the structure of the investment to reflect the fact that cost structures of different technologies may vary in different markets.

86. In the current global environment where carbon markets are not playing a substantial or stabilizing role in enhancing the economics of renewable energy projects, payments generated under legally-binding power selling agreement(s) are the largest, and oftentimes the only reliable source of revenue for a project developer. Frequently, these payments rely on the pricing that is directly or indirectly set by the government through the utility agency or grid operator, and are subject to policy and regulatory uncertainties. Furthermore, the risk of potential changes in the policy and regulatory environment is sometimes overestimated—and to some extent ‘contaminated’ by the occurrence of adverse changes in regulatory environment in other countries, thus ‘importing’ or ‘heightening’ perceived risks. These real and perceived risks pose a major barrier to investment.

87. There are additional barriers to investment, particularly in developing countries. Although renewable energy technology development and generation costs are coming down substantially in many countries, several developing economies still face higher costs and barriers to the adoption of renewable energy technologies. As with many new and emerging sectors, renewable energy projects will need to build up a critical mass of track record to be able to fully draw on commercial financing.

88. Risk mitigation instruments are currently available from MDBs to mitigate some regulatory risk in projects in the context of privatizations and traditional project financing. However, the uptake of such instruments by the private sector through public sector arms of the MDBs is hampered by the fact that a 100 percent sovereign counter-guarantee from the beneficiary government is required. These types of counter-guarantees tie up scarce budgetary resources of beneficiary governments, thus dampening the interest and ability to use these risk

mitigation instruments. They are also complex to implement in line with the project cycle of private sector projects.

89. Another set of available instruments provide protection against government's discriminatory actions, where the project sponsor is affected in a manner different from other market participants. These instruments include, for example, political risk insurance for expropriation or breach of contract. However, actions of the government directed at changing the regulatory environment across an entire sub-sector or the inability of an offtaker to meet its payment obligations due to regulatory changes are not sufficiently covered by these instruments.

90. For all the above reasons, a certain level of policy and regulatory support is needed and crucial to spur the development of renewable energy projects. Most importantly, this support needs to be stable and predictable to attract private sector financing of the underlying projects. Using CTF funds to defray some of these real and perceived regulatory risks would result in overall de-risking of the investment, and improving the project sponsor's access to sources of capital with more favorable terms and conditions while contributing to improving the investment environment and overcoming such initial barriers.

How proposal will address barriers

91. *Lessons from existing experience.* Literature points out to the detrimental effect of policy instability. For example, a study that looked into the effect of Renewable Portfolio Standards (RPS) enactment in different states in the US indicates that investments flows increased significantly less in states with a history of regulatory reversals. In states that had not previously repealed restructuring legislation, the average increase in new renewable energy generation assets after RPS enactment was almost three fold more than in the states that had policy reversal incidents in the past.¹⁷ Moreover, in states with a history of regulatory repeal, the increase in investment after RPS enactment was not statistically significant relative to the states that did not enact RPS at all.

92. The case of Bulgaria and Spain, for example, further demonstrates both a devastating short-term effect of policy reversals or changes, as well as longer-lived effects. In addition, it indicates that the perceived regulatory risks are no longer contained to one country. Policy reversals in one country result in additional risk premium imposed to the projects in another country within or outside the same continent out of fear that the governments of other countries may follow suit.

93. Risk-mitigation structures developed under this program will serve as a buffer against adverse changes in the economics of the project caused by unanticipated regulatory revisions. The proposed risk mitigation structures will be specifically tailored to mitigate retroactive changes affecting viability of the project. This proposal seeks to increase the predictability and reliability of these types of payments for projects by using CTF funds to provide concessionality to the financing package in case of unpredicted/unexpected changes in the regulatory environment, i.e. an ex-post subsidy.

¹⁷ Fabrizio, K.R., The Effect of Regulatory Uncertainty on Investment: Evidence from Renewable Energy Generation, Journal of Law, Economics, and Organization, 2012

94. For example, an equity or debt investment under this sub-program could be provided on the same terms as the other (commercial) investors in the project (unless the mitigation of other market barrier requires concessionality to also be structured upfront), with a regulatory risk mitigation clause that would kick-in if newly introduced changes in the regulatory environment or some other trigger event alter the project's ability to maintain a preset level of debt service (established under original policy conditions). In the event of such a change, the CTF funds could provide some form of concessionality, by either deferring dividends or interest/principal repayments, or by capping dividends or interest/principal repayments on its investment relative to the other investors in the project, or through some other form of subordination. Except if concessionality is needed upfront by the project to deal with other market barriers, the CTF funds would receive the same market rate of return as senior lenders unless the trigger event occurs, in which case the concessionality would be activated. In such a scenario, the implied concessionality of the CTF funds would protect the senior lenders by lowering their exposure and risk, which in turn will enable the project to go forward. Thus, CTF lowers the risk for senior lenders by reducing their exposure in the project and by protecting debt service coverage in the event of adverse tariff changes. In addition, the project can employ one of the political risk insurance instruments, provided by MIGA or other PRI company, to fully mitigate and properly allocate political/regulatory risks. This structure will help attract commercial co-finance and increase the scope of participating capital providers.

95. *Longer-term vision.* The goal of this program is to establish a track record of the technical and financial viability of private sector renewable energy projects, thereby accelerating development of the renewable energy sector in a country. Future project developers are expected to benefit from these efforts through decreased technology costs and established markets for supply, services, and tailored financial products. Once projects funded by this program begin to consistently demonstrate commercial viability and the perception of risk decreases, the availability and cost of long-term capital is expected to improve to a point where new projects will be financed on a fully commercial basis without the contingent risk protection or with a lower risk protection level.

96. MDBs will also aim to engage with regulatory and policymaking authorities to assess the perception of regulatory risk and help enhancing the quality of regulatory frameworks. This engagement could take the form of cooperation in the development of primary and secondary legislation as well as policy engagement on setting appropriate support levels. Similarly to the support CTF has already provided in Kazakhstan, this cooperation will aim to (i) ensure long-term affordability of the policy for the country and (ii) reduce the risk to project developers.

Market size potential

97. The program would be open to project sponsors involved in the development of any type of green-field renewable energy project in one of the pilot countries. Initial demand is estimated to be strong, as most of the CTF pilot countries are undergoing policy reforms targeted to improve investment profiles of green projects. These reforms, while enhancing project economics, also create an additional sense of uncertainty and perceived risk, which can be mitigated by using instrument(s) included in this program. Short-term pipeline will come from

the CTF pilot countries such as Jordan, Kazakhstan, Nigeria, or Ukraine, that currently offer FiTs or other renewable energy regulatory incentives.

98. It is expected that the first phase of the program will be able to contribute to three to five investments in selected pilot countries. The CTF funds request of USD 75 million is expected to leverage the amount of project financing in USD 400 - 1,500 million range, leading to 250MW to 1,500MW of additional installed capacity.

99. A sample application of this program will be through AfDB's partial risk guarantee (PRG) program in Nigeria. AfDB has developed this PRG program with USD 95 million of its own resources to support Nigeria's power sector privatization and seeks to deploy additional CTF resources (of up to USD 50 million) under this program to enhance risk coverage. The CTF portion of the funds will help the PRG protect private investors and/or lenders against the risk of changing terms of the power purchase agreement (PPA) between independent power producers (IPPs) and the Nigeria Bulk Electricity Trading PLC (NBET). The provision of PRG is expected to help IPPs mitigate regulatory risks and to increase electricity generation in Nigeria by catalyzing private sector finance in the power sector. As a result, a total of USD 145 million from AfDB and the CTF may catalyze up to USD 1,140 million of private sector investment, for a leverage effect of 8x. If the PRG is not called over the life of the program, the CTF resources of USD 50 million will be returned to this program.

C. Proposal Terms and Implementation Strategy

Financial instruments to be used

100. This program proposes to use a mix of instruments tailored to specific country, technology, and project circumstances. The instruments may include: senior and subordinated-debt, guarantees, equity, quasi-equity, and other forms of mezzanine financing. For the most part, this program will make direct investments in renewable energy projects by financing project developers and provide contingency risk mitigation for senior lenders and other investors in such projects. In some other cases, for example as noted earlier with respect to the AfDB application, there will be no direct CTF funded investment in the project, but an unfunded risk mitigation guarantee. As described earlier, the key element of the instrument would be the triggering of concessionality if (and only if) an adverse policy or regulatory event occurs such that the project economics are impaired. The structuring of the specific investment will be tailored to the project, sector and country needs.

Key stakeholders and implementation strategy

101. All MDBs have expressed interest in the proposal. Key stakeholders are the government, regulatory authorities, private sector project developers, NGOs, and other financiers. The involvement of CTF operational focal points, and other governance and decision making will follow the general procedures outlined in the main text.

D. Results Framework

102. *Core indicators.* Core indicators and targets to be used to monitor outcomes and impacts include:

- a) GHGs reduced: GHG reductions will be measured by the relevant MDB using its existing methodologies and expected to be somewhere in the range of 300,000 to 1,000,000 tCO₂e per year.
- b) MWhs generated or saved: Annual electricity generation enabled through the first phase of the program is expected to be about 500 to 1,900 GWh per year.
- c) Leverage from CTF Funds (separating public and private sources): The funds will be used in combination with MDBs' own resources and project sponsor's investments, delivering high and sustainable level of leverage. Overall, the first phase funding of US\$75 million will be able to leverage up to US\$1,500 million of total project financing.

103. *Co-Benefits.* The program will generate various co-benefits including: (i) Increased perception of policy stability; (ii) Additional amounts of private capital, including foreign capital, attracted into domestic investments; (iii) Accelerated rate of technology adoption leading to rapid cost and risk premiums reduction; (iv) Avoidance of supply chain interruptions, assuring greater stability in employment, business development, and progressive cost reduction; (v) Accumulated knowledge and experience in regulatory risk management and mitigation, potentially leading to lowering the cost of risk mitigation options.

E. Consistency with CTF investment criteria

CTF Investment Criteria	Program Compliance
Potential GHG Emissions Savings	The program is estimated to enable investments that would lead to about 300,000 to 1,000,000 tCO ₂ e per year of GHG savings or up to 20 MtCO ₂ e over an asset life of 20 years. In particular, AfDB's Nigeria PRG program is expected to attain 15.9 MtCO ₂ e of GHG savings over 20 years.
Cost-effectiveness	Based on the assumptions of the GHG reductions above and CTF financing of USD 75 million, the estimated cost of GHG reduction in this program will be below USD 12.5 per ton of CO ₂ e. Particularly, in the case of Nigeria, the estimated cost could be as low as USD 3.14 per ton of CO ₂ e.
Demonstration Potential at Scale	the proposed program will allow to demonstrate a potential in (i) Increasing perception of policy stability; (ii) Accelerating private investments; (iii) Faster technology adoption and cost and risk premiums reduction rates; (iv) Scaling up regulatory risk mitigation instruments. In addition, the sub-program will likely have a noticeable effect beyond participating countries, decreasing perceived regulatory risks in the neighbor countries

CTF Investment Criteria	Program Compliance
	and, potentially, globally.
Development Impact	Beyond the benefits of allowing many renewable energy programs to attract capital at lower costs – and, therefore, increasing the likelihood of deal closure, leading to decreased GHG emissions and local air pollutions, it is also expected that the program will: (i) Help drive down the costs of technologies faster; (ii) Provide more stable employment for the specific sub-sector, as well as for the supply chain, servicing sub-sectors, and other related businesses; (iii) Increase the knowledge sharing and technology adaption rates.
Implementation Potential	The program can be replicated across all the pilot countries and all the renewable energy technologies.
Financial Sustainability	The program is expected to generate a healthy rate of reflows and, therefore, be sustainably maintained and scaled up if needed. Overtime, the impact of the program will be felt in decreasing risk perception in the renewable energy field, enhancing financial viability of various initiatives.
Effective Utilization of Concessional Finance	Concessionality of CTF funds would be activated only in the event of failure of a regulatory commitment to materialize as anticipated when the project was initiated, thereby providing an ex-post subsidy. The program will therefore deliver a substantial development impact, with relatively low level of concessionality.
Mitigation of Market Distortions	Regulatory risk mitigation instruments and the sub-program itself will not create any additional market distortions. The instruments themselves will continue to operate on market terms, unless the regulatory environment changes adversely. In latter case, the instruments will be positioned to partially absorb worsening of economics of the project.
Risks	Potential risks include slow uptake of the risk mitigation product due to increased complexity of the deals; moral hazard; inability to bring in sufficient co-financing from other third-party investors

F. Funding

104. Phase I of the program will require USD 90 million to launch. During the Phase I, the program is expected to contribute to three to five investments (up to 1,500MW of additional installed capacity) in several countries, leveraging as much as USD 1,500 million of project financing. For Phase I, AfDB is seeking USD 50 million for the PRG program in Nigeria, while EBRD could utilize up to USD 20 million for Jordan and the same amount in Kazakhstan, and other sub-projects are being developed in the pipeline

105. The program will implement a gradual, incremental approach. Once the first phase of the program establishes a reputation and accumulates experience by conducting activities in a few pilot countries, Phase II would bring in additional CTF pilot countries. The second phase can scale up the results achieved in the first phase, by deploying another USD 150 million of CTF capital.

106. Funding required for the scale up of the program will depend on continued appetite from investors, renewable energy technologies cost dynamics, and, most importantly, an ability of the program to reduce the global perception of instability of the regulatory environment. Success of the first two phases of the program might contribute to improving the perception of the regulatory stability globally, leading to smaller need in regulatory risk capital in each individual country. Then, in Phase III, the program could be expanded to non-pilot countries with an estimated funding of USD 200 million.

PROPOSAL NAME: RENEWABLE ENERGY MINI-GRIDS AND DISTRIBUTED POWER GENERATION

107. MDBs interested in participating: AfDB, ADB, IDB, IBRD

108. Relevant CTF pilot countries in Phase I: India, Indonesia, Philippines

109. Other potential countries (Pilot and Non-Pilot) in Phases II and III: Sustainable Energy for All (SE4All) countries (e.g., Bangladesh, Colombia, Ethiopia, Ghana, Honduras, Kenya, Nigeria)

A. Program overview

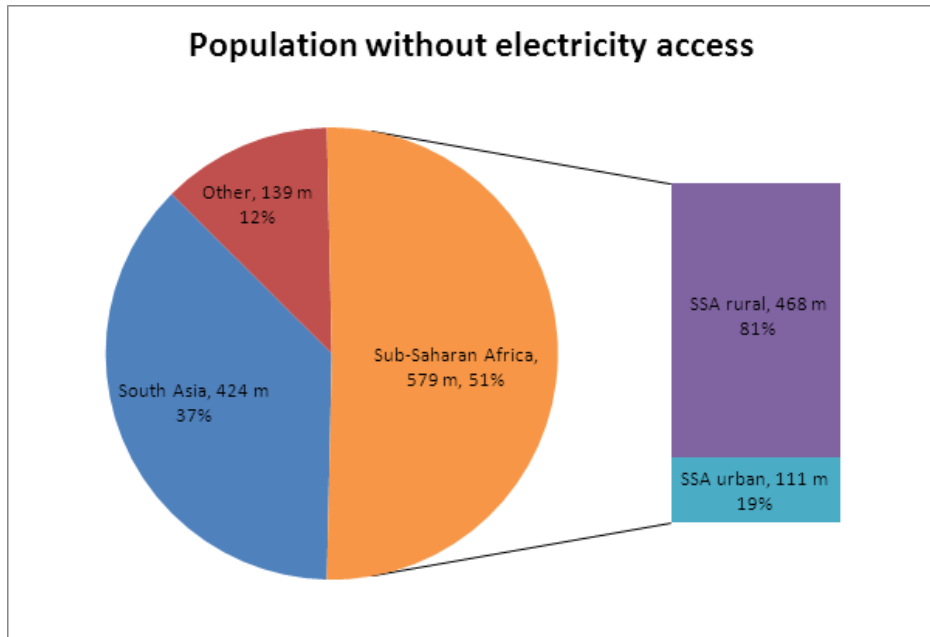
110. One of the principal challenges to economic growth in developing countries, especially in Africa, Asia and the Pacific, is the lack of access to reliable sources of energy. On the other hand it is now widely acknowledged that universal access to energy simply cannot be achieved without decentralized energy solutions. To achieve universal energy access by 2030 it is estimated that 100% of urban but only 30% of rural households will be connected to grid electricity, with the remaining 70% connected to mini-grids and isolated systems¹⁸. Of the 1,031 million additional people in sub-Saharan Africa requiring electricity by 2030, it is estimated that 607 million people (58.9%) will be best served with a grid connection, and 423 million people (41.1%) will be best served by decentralized energy solutions.

111. Approximately 1.2 billion people (17% of the global population) lack access to electricity and 2.8 billion rely on traditional biomass for cooking¹⁹. Some 50% of those without electricity (579 million people or 77% of the population), and 25% of those still using solid fuels for cooking (690 million people or 81% of the population), live in sub-Saharan Africa. All 20 of the countries with the lowest rates of access to electricity, and 19 of the 20 countries with the highest dependence on solid fuels, are in sub-Saharan Africa. Out of a total population of some 4.1 billion people in Asia and the Pacific, an estimated 1.9 billion people depend on burning traditional biomass for energy and in Asia an estimated 670 million people have no access to electricity²⁰. Communities continue to depend principally on biomass, kerosene, and candles to meet their lighting, cooking and heating needs; the use of such fuels has adverse impacts on health and safety of millions of low-income households.

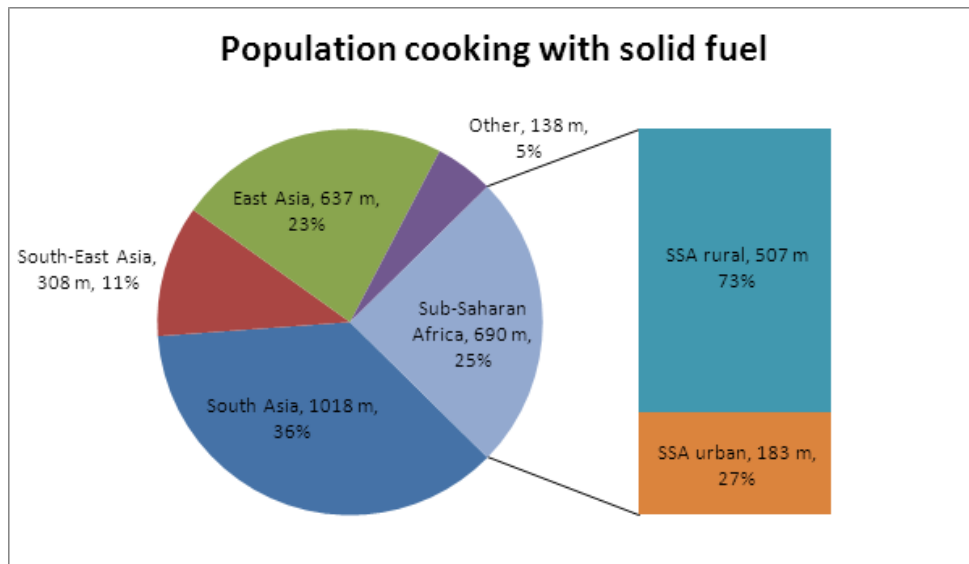
¹⁸ World Energy Outlook, 2010. International Energy Agency, Paris. “Decentralized options have an important role to play when grid extension is too expensive, and will probably provide the bulk of the additional connections over the project period to 2030.”

¹⁹ Unless otherwise stated, figures in this Introduction are drawn from the draft Global Tracking Framework of the World Bank / ESMAP, based on the World Bank Global Electrification Database 2012 and the WHO Energy Database 2012.

²⁰ World Energy Outlook, IEA, 2011



Source: SE4All Energy Access Global Tracking Framework consultation document



Source: SE4All Energy Access Global Tracking Framework consultation document

112. The demand for energy in Africa and Asia is projected to more than double and almost double, respectively, by 2030, and both regions face enormous challenges in meeting their commitments to expand energy access. Given the inadequacy of public resources, governments need to mobilize the resources of the private sector to meet this challenge. An important lesson learned from years of program implementation in the energy sector is that expanding energy access in rural and off-grid areas requires the deployment of multiple business delivery models to meet the somewhat unique situations of each country. Decentralized and distributed energy expansion models, e.g., “mini-grids” have proved to be viable options for the provision of electricity services in un-served and underserved areas. Mini-grids serving rural and off-grid areas have been successfully developed and provide reliable service in some African and Asian

countries, albeit at a high financial and environmental cost given that many of these systems operate solely with diesel generator sets.

113. Private sector entrepreneurs have piloted new business models to deliver such energy solutions in countries with enabling frameworks and in countries where small-scale rural services are not regulated. Mini-grids powered primarily by renewable energy (RE) resources, e.g., solar PV, micro and pico hydro, biomass-fired power, have also been installed depending on the availability of indigenous resources and the financial viability of the system. Mini-grids have the potential to transform the energy landscape by providing power generation locally, as opposed to large central power generation stations (traditionally powered by fossil fuels) with long transmission and distribution lines to load centers.

114. This proposal aims to leverage private investment to fill financing gaps and to promote the wide-spread development of RE mini-grids to serve rural communities and under-served²¹ off-grid communities with reliable, affordable and clean electricity, and to demonstrate business models that can be replicated and scaled up for wide-spread implementation. This has the potential to spur economic development, spawn employment-generating activities (including both direct and indirect jobs), and improve the social and economic well-being of rural communities including that of women and children who stand to directly benefit from the provision of RE services. While the size of such RE projects is inherently small, the scale up and replication potential is enormous (arguably almost infinite) considering the size of the underserved market segment in the pilot countries. The program intends to be transformational in moving these new energy consumers onto a low carbon growth trajectory and in addition, would generate significant developmental co-benefits. This proposal contends that any viable scaled mini-grid program structure needs to demonstrate a means of aggregating systems locally in order to build efficiencies in planning and financing, program administration, equipment supply, and operation and maintenance services; and that only by doing so can real scale be achieved. In the first phase, mini grid sites/projects will be selected in areas like the states of Uttar Pradesh and Bihar of India and Mindanao region of Philippines where energy access is less than 20% and high population density in villages/islands with practically no access to electricity. Projects will “bundle” villages and rural areas to bring scale to mini grid capacity (MW) to make it attractive to investors.

B. Business Case

Market and barriers to growth

115. To meet growing energy demand, governments (and even the MDBs) are too often focused on developing and raising finance for large, grid-connected energy projects (e.g., “ultra mega” power projects in India, “fast track” program of power generation projects in Indonesia), even if such projects frequently take upwards of five years to materialize. While there is no denying that large scale energy projects can result in economies of scale and significant economic and social benefits, such projects are designed to serve the growing demand of electricity deficient urban

²¹ This includes those areas, which are servicing only a few hours a day by a diesel gen-set. Partial provision of power is minimally acceptable for lighting needs, but does not provide stable power for project beneficiaries to invest in small appliances (e.g., refrigerators, engines, pumps, etc.) to start or expand a small business.

load centers and do not always benefit off-grid and rural communities where a large percentage of the population continue to live. Moreover, this traditional power delivery model in Africa and Asia and the Pacific has been unable to keep pace with rising energy demand in fast-growing countries such as Ethiopia, Ghana, India, Indonesia, Kenya, Nigeria and the Philippines.

Moreover, despite the best efforts by governments and the private sector IPPs, this traditional power delivery model has been unable to keep pace with rising energy demand in fast-growing countries. Large centralized projects for base-load power generation supply require: (i) long periods for land acquisition and negotiation with communities and persons affected by the project; (ii) 4-5 years for development, financing, construction and commissioning of the plant, (iii) dedicated supply of raw water for cooling (thereby competing with agricultural and domestic water needs of local communities); and (iv) secured linkages for long-term supply of fuel, either domestic or imported, which exacerbates the environmental and carbon footprint of the projects.

116. Distributed RE generation projects on the other hand tend to be quicker to install, have a smaller footprint and are more inclusive for communities, as they reap the direct benefits of electricity supply from locally available resources. Despite the relatively higher up-front capital costs, such projects can be financially and economically viable considering the displacement of high cost diesel gen-sets consuming imported fuels, the decreasing capital costs of RE systems, and the low levelized cost of RE electricity generation compared to diesel generation²². Further, the infrastructure of such distributed generation systems can be readily integrated into a national grid when such expansion becomes financially viable and can supplement generation on the grid system. An entrepreneurial private sector is keen to participate, provided it can raise the necessary financing, mitigate risks, and obtain a reasonable rate of return commensurate with the risks of operating a RE mini-grid system.

117. Countries now widely recognize the benefits of distributed generation and are willing to consider a two pronged strategy focusing on (i) utility scale power generation for meeting the growing demand on the grid and (ii) mini-grids to serve off-grid communities. Policy makers are also increasingly cognizant of the fact that this growth of the energy sector has to increasingly be fueled by clean energy sources not just to address concerns of global climate change but to reduce dependence on imported energy resources in volatile energy markets and conserve scarce foreign currency reserves, and their desire to improve energy security. However, while there is broad political and policy support for sustainable and low carbon development pathways, political, fiscal, institutional, market, and social realities continue to pose challenges to the widespread development of distributed generation schemes and RE mini-grids.

118. The development of RE mini-grids faces several barriers and risks:

- a) Technical: low demand and poor capacity utilization factor of the system due to low productive energy use; poor resource assessment and load assessment; intermittent RE generation; lack of trained personnel to manage and operate RE systems in remote areas; lack of technical standards/code for mini grid development.

²² ESMAP, World Bank, McKinsey Analysis, 2011

- b) Policy and Regulatory: the risk of policy changes that can reduce or eliminate subsidies and incentives; lack of clarity on impacts of grid expansion on distributed generation and RE mini-grids; lack of clarity on tariff regulation; net metering policies which inhibit surplus generation to be fed to the main grid (after integration); government focus on large scale public projects.
- c) Institutional: weak institutional structure of agencies involved; the inappropriateness of CTF business models for the private sector; and previously agreed country and sector allocations under CTF which may limit ability to support the private sector.
- d) Financial: insufficient public funds to meet demand; perceived high risk and relatively low return on investment; risk of non-payment of tariffs; high transaction cost of financing small projects; high up-front capital costs for installing mini-grids; high interest rates and short tenors unsuited to implementing rural mini-grid projects; high cost of equity finance in developing countries; insufficient net worth and limited experience of private sector entrepreneurial firms which makes debt financing difficult; low liquidity and power sector exposure constraints of local commercial banks; inadequate experience of commercial banks to evaluate mini grid projects; difficulty in channeling MDB funds through local financial institutions.

How Proposal will address barriers

119. Lessons learned. Based on the MDBs experience, the inherently small size of these transactions is a fundamental barrier for raising finance. Many companies in the target countries have invested in the provision of off-grid electricity services through mini-grid operations. Some of these have been successful in raising early-stage equity capital from the local markets and impact investment funds, but due to financial barriers mentioned above, this has unfortunately not been sufficient to catalyze debt financing for scale up of operations.

120. Another impediment to greater private sector activity in this area is payment risk, whereby customers do not pay for the electricity received. In some cases, securing a large offtaker e.g., a telecom operator, for a majority of the power supply (where the remainder is still sufficient to supply underserved or off-grid local consumers) helps ameliorate the payment risk. ADB's experience in undertaking similar investments in India shows that a "pay as you go" model for supplying affordable solar energy mitigates this risk. In 2013, ADB approved a \$2 million equity investment in Simpa Networks in India²³. Customers make an initial down payment and then pre-pay their energy service in small user-defined increments using a mobile phone. Each payment adds towards their final purchase price. Once fully paid, the system unlocks permanently and continues to produce electricity. The technology can be offered to RE micro-grid developers as an extremely flexible prepaid metering, customer, and revenue management solution. There are similar solutions being implemented in sub-Saharan Africa. Innovative business models (e.g., a telecom tower operator anchors mini-grid project) are

²³ More information can be found at: <http://simpanetworks.com>

operating successfully on a pilot scale, but face a major challenge is to raise debt/equity from commercial banks and funds. Commercial financiers consider these types of projects too small for investment.. The proposed mini grid program will contribute the required initial capital in reputable mini grid companies, which will help bring scale to the project and raise further investment from commercial banks and funds once these companies and their balance sheets mature through successful operations.

121. The program will: (i) target locally available RE resources with significant potential to meet power demand of mini-grids; (ii) mobilize investment from private sector and other sources; (iii) increase the supply of RE in the energy mix, thereby improving energy security; (iv) promote energy efficiency measures as an integral part of the RE mini-grid implementation to lower electricity demand and expand the number of customers connected to the system, and lower customer consumption and spending on electricity; and (v) demonstrate business models for distributed generation and RE mini-grids that can be replicated and scaled-up across the country and region.

122. The program will concentrate on addressing financial and structural barriers to private sector led development of mini-grids and distributed generation. Thus, the focus of the first phase will be on countries where other market barriers to mini-grids, such as a lack of supportive policies and regulations, institutional and technical barriers, including poor capacity of the private sector are either low or being addressed by other, complementary initiatives. The program will be initially promoted in India, Indonesia and the Philippines, which meet the criteria outlined above.

Market size potential

123. The market potential for development of distributed generation and mini-grids in each of the three selected countries is substantial, as shown below. Through its Energy for All program, ADB is presently in discussion with approximately 30 mini grid enterprises in India, Philippines and Indonesia and preliminary due diligence has been done on these companies. Further ADB is in discussion with several regional impact investor funds, which have a good track record in small-scale energy access investment. This would provide ADB with access to a wider pipeline of projects and possible co-investing opportunities..

124. As of 2011, there were 81 million households in **India** without access to electricity of which around 75 million rural households. The Electricity Act of 2003 supports rural electrification and de-licensing of rural power supply, and the Rural Electrification Policy of 2006 supports grid connected and off-grid electricity solutions. The 2011 census also states that 31.6% of all households and 43.2% of rural households use kerosene as their main source of lighting. Kerosene is predominantly used for lighting in the eight low-income states, Bihar, Uttar Pradesh, Assam, Orissa, Jharkhand, West Bengal, Madhya Pradesh and Rajasthan. These states collectively account for 84% (approximately 68 million households) of the total off-grid households in India. Additionally there are a number of rural electrification schemes that support mini-grid operations, which are operated by state utilities, rural cooperatives and the private sector. Several entrepreneurial private firms have invested in the provision of off-grid electricity services through mini-grid operations.

125. **The Philippines** does not have an integrated national electricity grid; there are two major regional grids and many smaller island isolated systems. The rate of electrification in the Philippines is relatively high and as of 2012, 79% or 48.6 million out of 61.53 million people were electrified. The Philippines possesses good RE resources in terms of small hydro, wind, biomass and solar power. The Electric Power Industry Reform Act supports the implementation of several policy mechanisms for the development of RE, RE portfolio standards, and net metering, but implementation remains a work in progress. Feed-in-tariffs (FiT) have also been designed for RE segments and publicly announced, but allocations will not be confirmed to private sector sponsors until the project is commissioned (a difficult scenario in which to raise debt financing). In addition, detailed implementation rules and regulations are still in process. Finally, the FiT allocations are relatively small for some segments (e.g., only 50 MW of solar power nationally), with project demand well in excess of the allocation. All of which has constrained private sector development of RE projects, whether on or off-grid.

126. Generation for off-grid electrification is provided by private firms under the Small Power Utilities Group (SPUG) Program of the National Power Corporation, and there presently are 534 generating units with total rated capacity of 278 MW (this capacity is mostly comprised of small diesel-fueled power plants), which serve 221 island grids including 8 isolated grids.²⁴ Most of these grids are too small for traditional power supply solutions and interconnection remains capital intensive and lengthy. The program has introduced a competitive bidding process for 15-year concessions to select the lowest cost generation options. Generation and output based subsidies are available to cover the difference between generation costs and retail tariffs. Electricity service to remote and unviable areas is franchised to qualified third parties or QTPs. Such implementation models could be scaled up to reduce the operation of diesel gen-sets in the Philippines where solar energy and other RE potential is cost effective.

127. **Indonesia** has seen consistent increase in economic growth, yet some 25% of Indonesians do not have access to electricity²⁵. Like the Philippines, the archipelago of Indonesia does not have an integrated grid. The Government has accelerated efforts to develop new and renewable energy sources to meet future energy demand. Presidential Decree No. 5 mandates an increase in renewable energy production from 7% to 15% of generating capacity by 2025, which will require the installation of some 6.7 GW of RE projects. The National Energy Policy of 2006 has amended several policies and regulations to support renewable energy deployment. The law codified the RE target and strengthened the position of cooperatives, private companies, and community organizations in PPA negotiations. The Ministerial Regulation on Small-Scale Power Purchase Agreements requires PLN to purchase electricity generated from renewable energy sources by non-PLN producers for projects of up to 1 MW capacity.

128. PLN and Pertamina are generally more focused on large scale RE projects (e.g., geothermal, storage based hydropower projects). There are plans to use public funds to leverage private investment and increase energy reliability and achieve a target of 90% electrification by 2020. The country has installed 53 centralized solar PV systems, and 51 micro/small scale hydro systems in off-grid regions totaling about 1.7 MW and powering some 10,000 households.

²⁴ There are also efforts underway to increase electrification through the hundreds of electric cooperatives through RE and energy efficiency initiatives to reduce losses. These programs would be complementary.

²⁵ <http://www.energyforall.info/25-of-indonesian-have-no-access-to-energy/>

Diesel generators however dominate power generation in the off-grid areas despite the high cost of transporting fuels to many sparsely populated islands. The abundance of RE sources in the country makes it an ideal candidate for installation of RE based mini-grid systems.

C. Proposal Terms and Implementation Strategy

Financial instruments to be used

129. In most cases, CTF resources would be deployed as investment capital (loans, guarantees and quasi-equity products) alongside an MDB investment. Resources will be used to finance gaps in the project's financing or company's plans to scale up implementation, partially mitigate credit risks of project sponsors, RE offtakers or perceived risks of other lenders, guarantee short or medium term loans to bridge timing gaps between capital expenditure needs and payment of government subsidies, and as lower-cost loans to help mitigate the high upfront capital costs of RE systems (high upfront costs are made harder and more expensive to finance by high lending rates in the target countries). As the projects are inherently small, the solutions are likely to be simple financial instruments with low transaction costs, and will be designed to deploy capital in a highly targeted manner to address unique market segment risks.

130. A portion of resources may be deployed into regional or country-specific impact investment funds, which are making direct equity or early stage investments in RE mini-grid projects and/or operators. While the focus of this program will be on direct investments in the pilot countries, this complementary approach will allow additional scale up of equity resources for certain approaches with some of the MDB's existing partners, where relevant.

Key stakeholders and implementation strategy

131. Key stakeholders are the government, regulatory authorities, private sector project developers and other financiers. The involvement of CTF operational focal points, and other governance and decision making will follow the general procedures outlined in the main text.

132. Through existing private sector operations and the SE4ALL program, the MDBs have already established strong engagements with the energy sector in all the target countries, and the MDBs will leverage its relationships with public and private sector stakeholders to quickly coalesce on a strategy to implement the distributed generation and RE mini-grid Program. The MDBs already have developed a pipeline of private sector projects in the pilot countries, which can begin implementation within six to nine months of CTF approval.

133. A key element of this program will be to share lessons on viable enterprise models across pilot and non-pilot countries in this market segment. ADB proposes to accomplish this through its Energy for All (E4ALL)²⁶ Partnership, which acts as a platform for collaboration between governments, civil society, and the private sector to share knowledge, build capacity, and develop projects. It is comprised of six working groups for biogas, small wind, enterprise development, lighting for all, the Pacific, and liquefied petroleum gas. Regular and periodic

²⁶ More information on this ADB-led knowledge sharing platform and partnership can be found at <http://www.energyforall.info/about/energy-for-all/>

workshops are held through the Asia and the Pacific region to present case studies to promote peer-to-peer learning. These organizations share the objective of providing 100 million people access to modern energy by 2015. ADB is the leading organization for energy access issues in Asia and the Pacific, and E4ALL is a pillar of ADB's Energy Policy. ADB's investment in energy access is expected to provide modern energy to more than 13 million households.

D. Results Framework

134. The proposed project will support the development of private sector led RE mini-grid projects, which will expand electricity access, and stimulate economic growth through the scaled-up deployment of clean energy solutions and provide a trigger for transformation of clean energy markets by unleashing the expertise and investment of the private sector.

135. *Core indicators.* While it is difficult to provide precise estimates of such targets for a program such as this, some of the key objectives and outcomes to be monitored and the indicators to be measured will include:

- a) Households supplied: the number of new household connections, and increase in the installed capacity (measured in MW and/or number of new plants) and electricity supplied from RE (in MWh per annum). In addition to households, the number of new small or micro enterprise electricity connections will also be tracked (to the extent information is available).
- b) Renewable energy generated: the amount of megawatt hours generated (or saved) per annum from the installation of renewable energy sources.
- c) GHG reductions: GHG mitigation in tons of CO₂ equivalent per annum.

136. *Co-benefits.* Community-based projects such as RE mini-grids promote participative decision making and gender and social inclusiveness. This program is expected to deliver significant co-benefits, most of which will disproportionately benefit women and children:

- a) Improvement in indoor air quality (substitution of kerosene and candles for lighting in households);
- b) Reduction of soot and the incomplete combustion of fossil fuels i.e., "black carbon" (from burning of traditional biomass for cooking and diesel-fired gensets);
- c) Direct and indirect job creation (a stable supply of electricity will increase the supply of light for extended hours of work and study in the household, and provide electricity for basic appliances);
- d) Improved communications and access to information (mobile phones, radio, television);

- e) Promote training and work force development to operate and maintain the RE mini-grid; and
- f) Enable seamless integration with the national grid and provide supplementary generation sources to improve reliability.

E. Consistency with CTF investment criteria

CTF Investment Criteria	Program Compliance
Potential GHG Emissions Savings	Modest GHG savings (e.g., 12,000 tons of CO ₂ equivalent per annum, excluding black carbon or 315,000 over the project's lifetime) with each individual project but will place local populations on low-carbon development pathways. In addition, the replication potential of the sub-program is significant, resulting in substantial GHG savings.
Cost-effectiveness	In terms of CTF cost effectiveness, the Program is estimated at CTF \$95 per ton of GHG reductions. However, this figure would be reduced once the impact of black carbon reductions is taken into account ²⁷ . Based on similar projects/programs, the marginal abatement cost of reducing a ton of CO ₂ equivalent is estimated at USD 2-4 per ton of CO ₂ . While the cost effectiveness figures are relatively high, we believe this does not properly account for the value of cobenefits generated by the program.
Demonstration Potential at Scale	The program will demonstrate the effectiveness of different business models for distributed generation and RE mini-grids, which will reduce transaction costs for replicating and scaling up of projects, create awareness among investors thus leveraging additional resources resulting in greater CO ₂ reductions. While RE mini-grid projects may be inherently small, the scale up potential if business models are proven viable is enormous (arguably infinitely scalable).
Development Impact	With expanded and assured access to affordable energy, local populations will have environmental co-benefits, job creation co-benefits and long-term low-carbon growth. Implementation of energy efficiency measures will expand capacity and lower customer bills. Increased RE in the mix will reduce GHG emissions and energy security will be improved.
Implementation Potential	The program meets the objectives of the CTF pilot countries to expand energy access to all by 2030, and to increase RE in the energy mix.
Additional Costs and Risk Premium	RE projects have higher upfront capital costs, although the levelized economic costs of such systems make them viable.

²⁷ Assumes a 25 operating life of PV panels and grid emissions factor for the substitution of diesel fired generation sets. Black carbon effects will be included in ADB's formal proposal submission.

CTF Investment Criteria	Program Compliance
	Indicative cost for mini grid project is \$3-5 per watt, excluding batteries. Because off-grid customers utilize expensive kerosene and diesel for energy, RE mini-grid systems will be more affordable for consumers. The program will lower the perception of risks of RE mini-grid systems among investors and address other barriers by developing appropriate business models. CTF funds deployed to catalyze long-term financing will enable investments in low-carbon technologies to become financially viable.
Financial Sustainability	The demonstration of successful business models will lower risk perception and catalyze additional investments from the private sector and lending from banks. The need for capital subsidies could eventually be phased out as RE system costs decrease further. CTF funds can also be used to mitigate government payment risks of such partial subsidy schemes.
Effective Utilization of Concessional Finance	The principle of minimal concessionality will be deployed. CTF funds may be used to provide concessional financing for the program in a targeted fashion to mitigate specific barriers, which will lead to greater leverage of funds from other financing sources.
Mitigation of Market Distortions	With over a billion people in developing countries without access to energy, the market for delivering energy solutions to off-grid consumers is massive. Any intervention to select CTF pilot countries would not distort the market. It will rather promote sustainable, safe and affordable energy access and foster private sector participation and investment by lowering risks and barriers.
Risks	The anticipated risks are discussed above in Section B. Risks will be evaluated for each project to be implemented under this program and measures taken to mitigate them.

F. Funding

137. Through its E4ALL Partnership, ADB has built a pipeline of over 30 mini-grid projects/companies in CTF pilot countries, which companies are seeking funding within the next 12 months. To begin implementation in Phase I (India, Indonesia, and Philippines), a sum of USD 35 million is requested from CTF, which is comprised of USD 30 million of investment capital (to be deployed as described above) and USD 5 million in grant. It is expected that Phase I will leverage a minimum of 10 RE mini-grid companies in the pilot countries described above in the next 12 months; it is assumed that each company may operate approximately 3-5 mini-grids. The grant funds will be used to (i) provide advisory services for business plan finalization and due diligence of the first set of projects; (ii) establish template legal documentation that can be replicated across projects and different products; and (iii) carry out other capacity building

activities with local financial institutions or investment partners which can help ensure leverage of capital resources from sources other than CTF and ADB.

138. Should implementation of Phase I be successful and additional capital required for the other pilot countries (Phase II) or non-pilot countries (Phase III), then such request will be made subsequently. It is not possible to estimate either demand or replication potential at this time due to the small-scale nature of the projects contemplated.

PROPOSAL NAME: CLIMATE FINANCE EQUITY INVESTMENTS

139. MDBs interested in participating: ADB, AfDB and IDB

140. Relevant countries in Phase I: Africa, Asia/Pacific and Latin American and the Caribbean

A. Introduction and Program Description

141. Developing countries face a dual challenge of climate change and limited access to energy and other resources. At the same time the annual climate investment gap of around USD 1 trillion necessitates innovative engagement of the private sector if the above challenges are to be met. The Climate Finance Equity²⁸ Investment program (CFEI) will help address this gap and will: (i) target climate change mitigation technologies with significant potential in terms of Greenhouse Gas (GHG) emission reductions; (ii) maximize the mobilization of co-investment for low-carbon development; (iii) increase the supply of renewable energy; and (iv) increase energy efficiency. It will greatly contribute to overcoming a number of barriers faced by private sector institutional and equity investors such as: (i) first-mover risk; (ii) high capital and operational expenditures; (iii) technology risk; (iv) revenue volatility; (v) sovereign risk; and (vi) financing risk.

142. The Climate Finance Equity Investments Program is expected to be developed over two phases. In Phase I AfDB, ADB and IDB will launch programs in their respective regions. Other MDBs may join in Phase II.

143. CTF resources will be invested through separate investment and private equity vehicles and will play a catalytic role in leveraging other resources. While the goals of AfDB, ADB and IDB's programs are broadly the same, due to regional differences and needs they do differ in how they propose to deploy CTF resources, the market segments targeted and their impacts. As a result, this sub-program may appear to be more loosely tied together compared to the other 3 proposed sub-programs. If the TFC chooses to endorse this concept proposal, the MDBs and CIF AU believe that subsequent proposals by each MDB will be more clearly outlined and simpler to evaluate against the CTF investment criteria.

144. AfDB will follow an indirect equity investment approach over two stages. In stage one CTF funds will be blended with resources from AfDB and other investors that will be invested into Private Equity Funds ("PEFs"). In stage two, the PEFs will re-invest these resources in the form of equity instruments and in accordance with pre-negotiated investment policies. Given current market conditions, the African CTF pilot countries would not be able to absorb the resources requested. Consequently, CFEI as deployed by the AfDB will be available to all countries in which it operates in Africa, to include both CTF pilot and non-pilot countries.

²⁸ While the objective of the sub-program is to mitigate the climate finance equity gap, the sub-program may also include quasi-equity or mezzanine investment vehicles co-investing with equity funds.

145. ADB has alongside a commercial investment partner established an investment program, the Climate Public Private Partnership (“CP3”), which will invest between 20-40% in PEFs, and the remaining 60-80% in direct investments. Although CP3 has been approved by ADB’s board of directors and has recently initiated fund raising efforts, it was anticipated that investors could have different requirements in regard to making investments. CP3 consequently has the ability to customize large investments and can accept equity and / or debt, ring-fenced for specific purposes, and establish Alternative Investment Vehicles (“AIVs”).

146. IDB will utilize CTF resources under this program to cover the existing equity/mezzanine gap in investments being considered under other programs and funds that IDB is managing, structuring or investing in. The Sustainable Energy Investment Program (PIES) to be proposed by IDB will consist of an equity/mezzanine finance envelope to leverage various other IDB-managed programs and IDB-supported funds by providing the type of investment and risk mitigation resources needed to make viable a number of projects aligned with CTF objectives and criteria identified and currently under consideration for investment by these other programs.

B. Business Case

Market and barriers to growth

147. **The Challenge.** As a whole, developing countries are faced with many challenges, not least those of climate change and limited access to energy and other resources. Both have significant negative impacts on the poor populations of those countries, and neither of the challenges will be addressed with public finance alone. This is especially relevant for Africa which is poised to experience tremendous economic growth over the next several years but which is threatened by underdeveloped infrastructure, mainly in the power sector.

148. **The Funding Gap.** Current investments in mitigation and adaptation are estimated at around USD 0.5 trillion per annum, an investment that must triple if the goal of a temperature increase of no more than 2°C is to be achieved. This implies an approximate investment gap of around USD 1 trillion, which cannot be bridged solely by limited public sector resources. Rather, it is critical to find ways to unlock participation by private finance.

149. **The Funding Source.** Assets being managed by OECD countries alone amount to USD 71 trillion, some of which could be deployed towards green investments in emerging markets, but which are held back by policy distortions and uncertainties, along with market and technology risk. As such, it is not a lack of available finance that is holding back investment. Evidence suggests that the targeted use of public finance, through equity, debt and other financial products, can greatly help scale up private financial flows, which will be the key to unlocking the financing needed to close the investment gap in emerging markets.

150. **Additionality.** The perceived high risks associated with investing in sustainable energy assets and other areas of environmental finance has resulted in insufficient availability of funds for the sector, which remains an unexploited engine of growth for developing countries as a whole and for the African continent in particular. Through the provision of long-term investment

capital, the MDBs and CTF commitments are expected to mobilize additional capital through lowering the perceived risk of investments.

151. **Addressing Market Failures.** The proposals are designed not only to overcome specific challenges related to investing in sustainable energy and climate investments in general. They are more importantly designed to overcome a number of obstacles which separately or collectively has inhibited much needed investments, and will as such demonstrate to other market participants that it is possible to invest profitably in these sectors leveraging private sector capital while generating financial returns and development impact.

How Proposal will address barriers

152. **Ability to Address Market Bottlenecks.** The proposals promote a coordinated response to environmental finance market constraints, namely: (i) financial facilities (equity and mezzanine financing provided by the fund; dedicated technical assistance; and other climate change funds administered by the MDBs); (ii) the knowledge platforms of the respective banks which includes specialized environmental, social, and governance capabilities and a pool of technical experts in a broad range of sectors; and (iii) country dialogue and engagement (that reduce policy, regulatory and political barriers).

153. **Ability to Access and to Leverage Private Sector Capital.** The proposals expect to have significant ability to leverage private sector capital partly because of the value addition that MDBs bring and partly because strategy and risk profiles are specifically designed to appeal to institutional investors. This will allow for a dramatic catalytic effect.

154. **Ability to Generate Development Outcomes and Financial Returns.** The proposals seek to combine private sector returns with a strategy designed to maximize development impact. In addition to the unique catalytic effects, the proposals will: (i) promote foreign direct investment to fund target countries' infrastructure needs; (ii) attract international fund managers to the regions and also catalyze the local investor base, which will facilitate technology innovation, transfer, and diffusion; (iii) introduce AfDB, ADB and IDB to new, high-impact technologies or sectors; (iv) promote regional integration; and (v) likely have a higher impact than most existing operations in terms of many development metrics.

155. **Lessons learnt from experience:** Over the last 10 years, the AfDB has invested a total of USD 620 million in more than 20 PEFs, and the ADB has invested USD 723 million in more than 40 PEFs, which have had substantial development impact in the respective regions. However, concessional financing can help tip the balance for particular sectors and markets which otherwise are neglected by those PEFs investing in Africa, Asia and Latin America. It can also help make certain projects financially viable (through mezzanine financing) which would otherwise not pass internal tests of PEF fund managers.

Market size potential: Africa

156. AfDB will seek to deploy USD 40 million of CTF resources into a maximum of two PEFs that will leverage other resources, including those from AfDB. These PEFs will then re-invest those resources in accordance with pre-negotiated investment policies that will focus on renewable energy and energy efficiency, into approximately 10 portfolio projects per PEF. CTF resources will be critical to unlock a new class of investors/capital (e.g. pension funds, commercial investors) to Africa, especially if CTF investment is deployed with some degree of subordination (e.g. delayed access to the return waterfall, capped returns, etc.). Figure 1 introduces the structure of the proposed business case.

157. **Investment Size.** The total size of the PEFs is estimated at USD 200 million but this will depend on market appetite and on the risk perception of potential investors beyond the DFI community. With USD 40 million of CTF resources, AfDB will invest USD 40 million of its own resources and will raise an additional USD 160 million from other investors including development financing institutions (“DFIs”) and commercial investors, among others. Once formed, the PEFs will buy minority shares in project companies that will attract other sources of investment such as equity but mainly debt, contributing to leveraging further USD 1,130 million. AfDB is currently structuring the African Renewable Energy Fund (AREF), the first Renewable Energy Private Equity Fund in Africa with first close expected by the end of 2013 at a size of USD 100-150 million. CTF resources will be key to the success of the fund raising phase, contribute to bringing new investors to Africa and increase the number of projects supported downstream.

158. **Regional Coverage.** Due to Risk Management considerations related to current market conditions, the coverage of the proposed PEFs cannot be limited to CTF countries. As a consequence, the PEFs may invest not only in CTF pilot countries including Egypt, Morocco, Nigeria and South Africa, but also in non-CTF African countries with enabling policy and regulatory framework and market potential for private sector investment in the energy sector. Some SREP countries such as Kenya, Tanzania and Ethiopia may be targeted. This will ensure proper diversification of investments not only across countries but also regions and is in line with risk management standards.

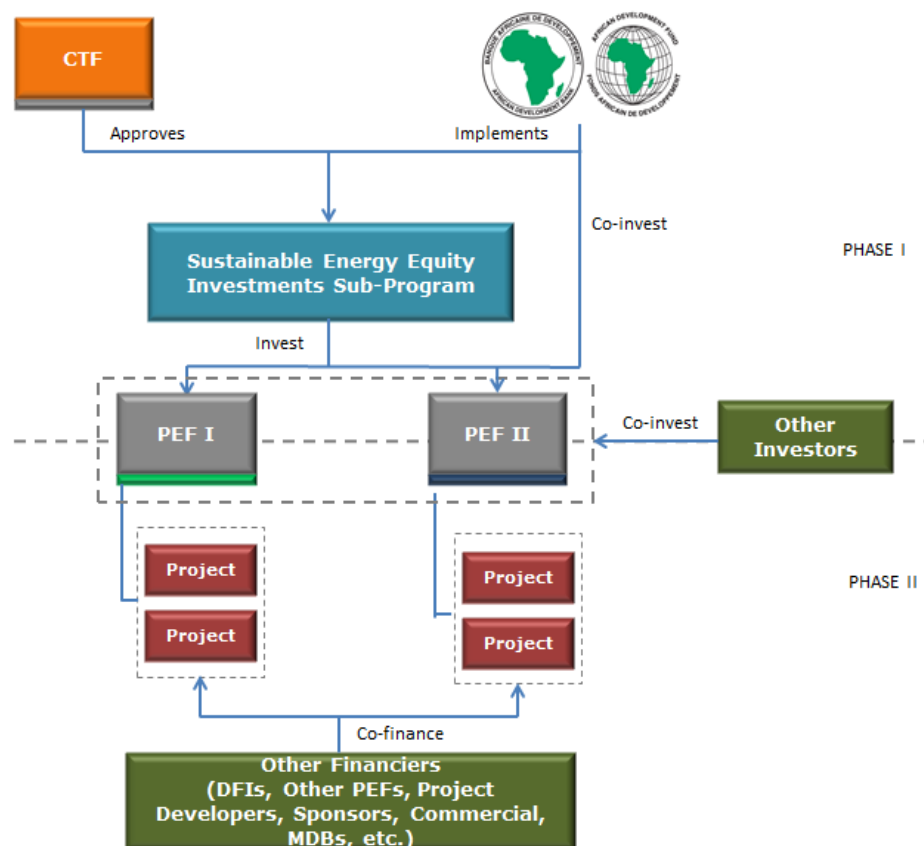
159. **Investment Strategy.** The PEFs will invest in renewable energy and energy efficiency projects that are capable of generating cash-flows. All types of renewable energy and energy efficiency technologies operationally proven and economically mature, including solar, wind, hydro and geothermal will be targeted by the PEFs, as considering different technological capacities and cost-competitiveness in different target countries. Exposure to a specific country or technology will be limited to mitigate risk. Average deal size is expected to range between USD 10~30 million which will enable small to medium size projects with the generation capacity up to around 50MW. The PEFs will invest in and hold projects for about 5 to 7 years and aim at nearly 25% of the internal rate of return (IRR).

160. **Profit Distribution.** Details on profit distribution will be determined once the PEFs are established and the investment policies are articulated. However, AfDB plans to have multi-tiered equity structures. CTF resources may be located in the subordinated tier to other investors

in the PEFs or be deployed with capped returns. Once the preferred return to the first tier equity holders, for example 8%, is met, the rest of profits will be allocated to the first and subordinated tiers according to the predefined ratio. This profit distribution will increase commercial attractiveness of the PEFs by improving returns and expand the range of potentially investable projects. CFEI is differentiated from other existing PEFs in this way and achieves additionality rather than crowding out other investments by investing in projects beyond the spectrum where other PEFs are focusing on.

161. **Investment Pipeline.** Investment opportunities in sustainable energy projects are substantial, both in terms of existing facilities and projects in development. A market study commissioned by AfDB in 2012 during the structuring phase of AREF reveals that between 2000 and 2012, over 150 renewable energy projects were completed in sub-Saharan Africa (excluding South Africa). The potential of expanding renewable energy even further is significant, particularly in small and medium renewable energy projects. A market scoping exercise led by AfDB shows that there are currently over 300 renewable energy projects at various stages of development. Detailed information on the pipeline of each PEF will be provided once the proposal is presented to the CTF Trust Fund Committee.

Figure 1: Implementation Diagram



162. **Leverage.** For each USD 10 million of CTF resources provided under the AfDB’s business case, a total of USD 283 million may be leveraged downstream. The main contribution

for this leverage effect lies at the project level. In the African infrastructure context, a rule of thumb is to finance projects with a combination of debt and equity at a 30/70 ratio. Assuming that a PEF will at no point in time hold more than 49% of a Project Company's shares (approximately 15% of the 30% total equity stake), the leverage potential of any direct equity investments made by a PEF into a project company is 1 to 6.67 from different types of investors and financiers. Given the size of CTF resources being requested under this business case and based on the assumptions and calculations provided above, the USD 40 million CTF resources in equity will contribute to leverage further USD 1,130 million over a period of 7-9 years. This represents an overall leverage ratio of 28.3x.

163. **GHG Emission Savings.** Although it is difficult to establish ex ante the amount of emission reductions due to different potentials of different technologies and unclear portfolio structures, preliminary calculations based on a number of realistic assumptions point out to savings in the order of 23.3 million tons of CO₂ emissions over a lifespan of 25-years for the portfolio projects. It would be also possible to demonstrate a higher potential when the leverage effect of the equity investment is proven to be larger than the initial expectation. Based on the aforementioned preliminary calculations and assuming USD 40 million in CTF resources for the AfDB business plan, the cost for a unit emission reduction is estimated to be approximately USD 1.72 of CTF funding. Each portfolio company will, under the supervision of each PEF as a major shareholder, track and account for reductions in emissions. This requirement will be included in limited partner agreements to be signed between AfDB and a PEF. The sum of total emission reductions will be reported to TFC semi-annually.

Market size potential: Asia and Pacific

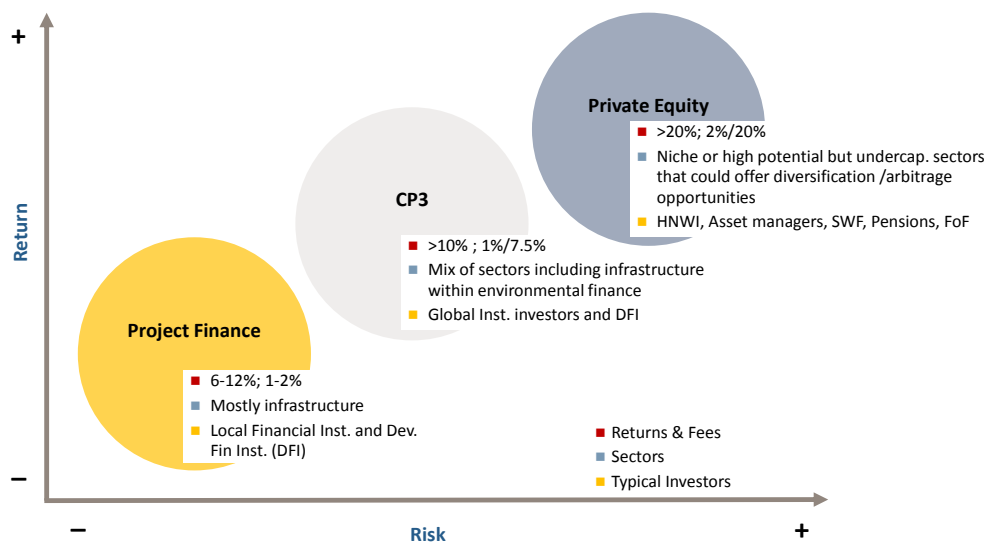
164. ADB's CP3 has been designed as a comprehensive investment program. This allows it to accept investments both in the form of equity and debt, and when needed tailor-make alternative investment vehicles ("AIVs") for investors with special requirements. An AIV would co-invest in specific projects alongside the main fund on broadly the same terms and conditions, i.e. investors may have specific geographic or sector preferences (e.g., pilot countries), which CP3 can accommodate, while still subject to the same restrictions regarding for instance investing sustainably according to the policies of ADB.

165. **Differentiators.** CP3 differs substantially from existing private sector PEFs in a number of ways: (i) size and opportunity, (ii) risk-mitigation, (iii) environmental and social safeguards, (iv) deal sourcing and track record, (v) diversification, (vi) fee structure. All of which are not only key to ensure successful fundraising among private sector investors but will further be key to ensuring successful deployment of funds. Additionally, CP3 is a unique new and complimentary instrument in the market, which will be able to leverage existing debt and equity facilities that will greatly increase the impact (please see Figure 2).

166. **Leverage.** The aggregate target size of CP3 is USD 1,500 million of mixed public institutional and private sector funding. A direct equity investment of USD 75 million from the CTF towards a first close of USD 500 million will potentially help catalyze up to an additional

USD 5.5 billion in both debt and equity investments, for a leverage effect of 73x²⁹. An investment in the way of mezzanine or sub-debt would also have a significant catalytic effect, though more challenging to accurately estimate³⁰.

Figure 2: CP3 fills a blank spot in the risk-return spectrum



167. **Investment Strategy.** CP3 can broadly speaking invest in all of AsDB’s developing member countries, but will constrain itself to 30% or less in both China and India respectively, with the remainder expected to be invested in developing Asia, among others targeting countries such as Bangladesh, Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. CP3 expects to invest into three broad sectors: 1) renewable energy infrastructure (e.g., wind, solar, geothermal), 2) Energy Efficiency (e.g., green buildings, electric vehicles, waste heat recovery), and 3) “nature based assets” (e.g., agriculture, forestry water).

168. **Investment Pipeline.** Though not yet operational, CP3 is, in anticipation of fund formation (expected in Q3 2013), currently tracking in excess of 100 investment funds that are currently fund-raising or are expected to begin fund-raising soon, which broadly meet CP3’s investment criteria. These Funds have been carefully screened and assessed and divided into three overall tiers where 73 fall into Tier I and II, and thus present the best investment opportunities. Collectively these 73 funds are seeking to raise around USD 16.8 billion and currently have a funding “gap” of around USD 11 billion. Examples of funds being tracked are: Nereus, Asia Strategy Capital Fund, Asia Environmental Partners, India Agribusiness, and TPG Cleantech.³¹ In addition to the funds, CP3 is continuously being presented with and considering various potential direct co-investment opportunities.

²⁹ Assumptions on the leverage effect of CTF’s investment alongside CP3 will provided in the subsequent ADB proposal. When CTF financing is subordinated to other debt providers, it can offer a much higher leverage effect than senior debt.

³⁰ A significant commitment as mezzanine through an AIV would on its own have a leverage effect that is likely to be substantial, though probably less so than equity. At the same time, a mezzanine AIV would potentially aid equity fundraising for funds.

³¹ A more detailed investment pipeline will be presented in the subsequent ADB proposal.

169. **Asset Allocation.** CP3 will invest between 20–40% in investment funds and the remaining 60–80% in direct co-investments. In addition to investing according to its sector allocation, CP3 will furthermore invest across all stages of the private equity life-cycle ranging from early stage venture capital over growth investments to leveraged buy-outs. CP3 expects to invest up to 50% in renewable energy infrastructure with the remainder in private equity. This asset allocation strategy will allow CP3 to increase its scale and reach significantly, via sub-investments by the investment funds, while at the same time providing a pipeline of potential direct co-investments, collectively achieving a multiplier effect of up to 6x on the fund as a whole.

170. **Development Impact.** CP3 has been specifically designed to “do good by doing well.” While the focus is on generating market returns, which is critical to attract private sector investors, development goals such as job creation, taxes generated, technology and skills transfer, GHG emission savings, environmental and social compliance, and FDI promotion have not been neglected and are expected to be substantial. The commercial investment manager will be required to track performance indicators and results on an annual basis of all investments made (including investments in private equity funds) to comply with ADB and CTF requirements.

171. **Fundraising.** CP3 has been approved both by ADB’s board of directors and the UK Government (an anchor investor). ADB expects fund formation this quarter and anticipates a first close of no less than USD 500 million no later than Q1 2014, at which point it will be able to make investments. To date, CP3 has secured USD 330 million in equity commitments. The UK Government and ADB have both committed USD 100 million respectively to the program as limited partners, while the commercial investment manager has committed USD 130 million. CP3 will be managed by a dedicated team consisting of staff from the commercial partner³², a reputable private equity investment manager, as well as ADB staff who are specialized in private equity investing. The staff will work together as one team and follow the processes of the commercial partner. CP3 has market return benchmarks, and will be managed according to market best practices – both are absolutely critical for CP3 to attract private sector investors.

172. **CTF Commitment.** ADB proposes an investment of up to USD 75 million in CP3 from the CTF. This would greatly facilitate CP3’s fund raising efforts, helping to mitigate fundraising risk, and bringing CP3 much closer to its minimum first close of USD 500 million, which for many private sector investors represents the first hurdle that must be passed before they will commit (“success breeding success”). Thus, the CTF commitment would be instrumental in ensuring the sought after catalytic effect of leveraging private sector money alongside public money, which is one of the overall aims of CP3.

173. The simplest method for a CTF investment would be through an equity commitment. However, if so desired, the investment could be structured as a hybrid mezzanine financing.. A mezzanine structure has the further advantage of helping bridge potential funding gap between the equity and senior debt in individual deals, and may as such play a pivotal role in ensuring that viable direct or co-investments can be made with a good return, while not taking on

³² If required for TFC consideration, ADB can provide this information on a confidential basis. At this stage, the DPSP proposal is not classified as a confidential document.

excessive levels of senior debt or hollowing out returns on equity. This would provide additionality beyond ADB's and UK Government's investment, and create a combination of market instruments through the same investment platform, something not currently available at scale in the market.

174. A mezzanine investment would provide additionality in a number of ways.

- a) Based on ADB's experience in Asian emerging markets and our equity market assessment, there are no dedicated mezzanine funds in the region³³. Commercial banks typically only provide mezzanine financing in North America and Europe, and do not (or are at best, reluctant to do so) in Asia, mainly due to the lack of precedents and understanding of the hybrid product;
- b) mezzanine would in many cases help bridge potential financing gaps between the debt and the equity tranches in individual investments (e.g., where the CP3 investment manager has evaluated an economically viable investment but banks are unwilling to provide sufficient debt financing to balance risks and rewards);
- c) a dedicated co-investing mezzanine vehicle would help in attracting private sector equity investors into the main equity fund;

Market size potential: Latin America & Caribbean

175. As in other regions, renewable energy and energy efficiency investments in Latin America & Caribbean are currently restricted by limited access by project developers and investors to equity and mezzanine financing. IDB's proposed PIES program will provide resources to cover the existing equity/mezzanine gap in investments being considered under other programs and funds that IDB is managing, structuring or investing in. This program would therefore capitalize on other sources of financing managed or leveraged by the IDB Group (including its own capital, the trust funds it manages, third party financing it brings in through syndications or other co-investment strategies) as well as the project sourcing, investment and supervision systems in place for those other programs.

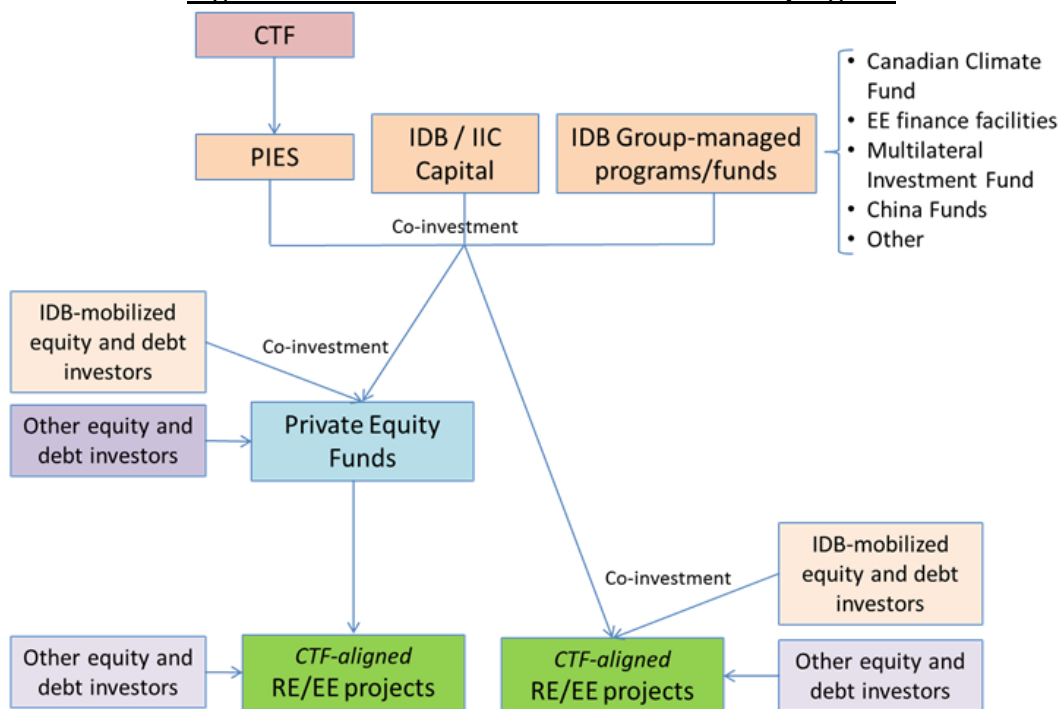
176. **Investment strategy.** IDB will propose a USD 50 million PIES program, which will support two types of investments: a) co-investment with other IDB-managed programs and funds, and b) co-investment in dedicated RE/EE Private Equity Funds. In both cases IDB will ensure that investee projects and funds are aligned with CTF objectives and criteria (sectors, countries, high demonstration, mitigation and leverage potential). IDB-managed programs and funds include: a) some which are specifically targeted to RE and EE investments (such as the Canadian Climate Fund or the IDB-NDF Energy Efficiency Finance Facility, for example), and b) others which are more sizeable but of a more general nature (such as Multilateral Investment Fund or the funds established between the Chinese Government and the IDB Group). Some of these programs/funds count with a portion of concessional resources, but others can only invest on commercial terms. Most of the funding available through these programs is in the form of

³³ A more detailed assessment of this finance market segment will be provided in the subsequent proposal for TFC's consideration.

loans and guarantees. Some however can offer technical assistance, grants, and some even equity (although on commercial terms only). CTF's equity and mezzanine financing would be used to enhance the economics and/or mitigate the risks preventing investments under consideration in these programs from happening. In addition, CTF co-financing would help drive additional resources towards the RE and EE sectors by offering risk mitigation and co-investment opportunities for the funds that are not exclusively targeted to RE/EE investments (such as the China funds). The table below presents sample programs and funds (non-exhaustive list) managed or supported by IDB that PIES would be leveraging.

Program/Fund	Fund Size (\$M)	Investors	Status	Financial products offered	Concessional?	Sectors
Co-invest with dedicated RE/EE funds or programs:						
Canadian Climate Fund for the Private Sector in the Americas	250	Canada (IDB will co-invest at least \$250M along with this Fund)	Investing	Loans and guarantees	Yes	EE, RE
IDB-NDF Energy Efficiency Finance Facility	60	IDB (50), NDF (10)	Investing	Loans and guarantees; TA grants	Yes	EE, on-site, small-scale RE
Colombia Financial Intermediaries Sustainable Energy Facility	90	IDB	Investing	Loans	No	EE
Brazil Energy Efficiency Guarantee Mechanism (EEGM)	25	IDB (15), GEF (10)	Investing	Guarantees	Yes	EE
Co-invest with non-dedicated funds:						
Multilateral Investment Fund	~100 pa*	Various	Investing	Loans, equity and TA grants	Just TA grants	All, including RE and EE
China Co-financing Fund for Latin America and the Caribbean	1500**	China (IDB will co-invest at least \$3B along with this Fund)	Investing	Loans	No	All, including RE and EE
China-IIC SME Equity Investment Trust Fund	75**	China (IDB will co-invest at least \$75M along with this Fund)	Investing	Equity and quasi-equity	No	
Co-invest in equity funds:						
Regional Fund I	150	Various, incl. IDB and GEF	Investing (first close at \$41M) and fundraising for final close	Equity and mezzanine	No	EE, RE
Regional Fund II	150	Various, incl. IDB	Investing (first close at \$25M) and fundraising for final close (\$54M raised)	Equity	No	EE, RE

Figure 3 – Co-investment structure of the PIES program



177. **Pipeline.** As mentioned, one of the benefits of this strategy is capitalizing the investment pipelines that these other programs and funds have already developed. As a sample, below we present summary pipeline information of some of the funds mentioned in the table above:

- a) **Canadian Climate Fund:** Rapidly growing pipeline of investments (about ten currently) at different stages of internal processing, for over USD 500 million of total project costs. The pipeline includes investments in solar, geothermal, wind, biomass, and building efficiency technologies in numerous LAC countries, including Chile, Colombia, Peru and Ecuador.
- b) **IDB–NDF Energy Efficiency Finance Facility.** Technical assistance resources provided by the Nordic Development Fund (NDF) and available under this facility (with a total of \$60M loan and guarantee resources from IDB and NDF) have been utilized to conduct engineering and financial assessments on a number of prospect projects, confirming a pipeline of over 30 investable projects, with total financing requirements above USD 30 million. Technologies identified include: standard energy efficiency retrofits (e.g., lighting, heating and cooling systems, refrigeration systems, etc.), solar heating, solar panels, and cogeneration through biogas, biomass and natural gas. In addition, small energy service providers in CTF countries have approached the facility as the companies try to move to an ESCO model that self-finances its projects. Equity or mezzanine debt investments in these companies would allow them to leverage additional debt to support a higher number of projects and generate more growth capital.

- c) **Regional Private Equity Fund I.** This is a private equity fund providing equity and mezzanine financing to projects in the demand-side energy efficiency and renewable energy sectors in Colombia, Mexico and other LAC countries. The Fund has raised about USD 41 million from anchor investors (including the IDB, through its Multilateral Investment Fund) and is looking for additional capital commitments (up to USD 100 million) in the next twelve months. The Fund will focus investments in energy efficiency in: a) the commercial sector, b) the industrial sector (cogeneration, waste heat recovery, other), and c) street lighting. It will also invest in small-scale renewable energy generation, including solar and hydro rehabilitation and expansion. Pipeline includes, among other, energy efficiency projects in the hotel sector in Colombia, and energy efficiency in air-conditioning, lighting and solar PV generation in public office buildings and schools in Mexico.

178. **Leverage.** Leverage factors will change on a case-by-case basis for different investments. IDB will target investments that will leverage resources at the program/fund and the project level. Expected leverage factors will range from 1:10 and 1:25 per investment and in considering them IDB will ensure they meet additionally requirements.

179. **GHG abatement and cost-effectiveness:** based on preliminary assumptions on a diversified allocation of resources across countries and technologies and the range of leverage factors mentioned above, a USD 50 million PIES program would result in 20-50 Mton of CO₂e abated, and between \$1 and \$2.5 of CTF investment per ton of CO₂e abated. The size of this range is a result of the aspects of the CTF CFEI program still to be defined. But even in this broad range all CTF investments would be highly cost-effective.

C. Results Framework

180. *Core indicators.* Core indicators to be monitored include:

- a) GHG emissions savings: for AfDB, target of 0.9 million tons per year; for ADB, target of 2.5 million tons per year; for IDB, target of 0.8-2 million tons per year.
- b) Increased finance (by public and private sources): AfDB's target is USD 1.1 billion over the investment life of the PEFs; ADB expects to mobilize USD 1.5 billion by final closing of CP3 in 2015; IDB expects to leverage between USD 0.5-1.25 billion during the investment period of this program and the supported PEFs.
- c) MW_hs generated or saved: Annual electricity generation enabled or saved through the first phase of the program targets will be established.
- d) Number of jobs created: ADB's target is 5,000 jobs per annum; AfDB and IDB's targets will be established in the coming months and presented in the formal proposal.

D. Consistency with CTF Criteria

CTF Investment Criteria	Program Compliance
Potential GHG Emissions Savings	Estimating GHG reductions without confirmed investment portfolios is a challenge, but based on indicative investment pipelines of the 3 participating MDBs, GHG reductions are estimated around 4-5 million tons for Phase I of the program.
Cost-effectiveness	The marginal cost of reducing a ton of CO ₂ is expected to be more efficient than in other CTF programs due to the strong leveraging effect of CTF capital (greater than 28x). AfDB estimates the cost effectiveness at USD 1.72 of CTF resources/ton of CO ₂ savings (specifically for renewable energy investments). IDB estimates cost-effectiveness of its investments at between USD 1 and USD 2.5 of CTF investment per ton of CO ₂ e abated. Because investments in the other sub-sectors are more difficult to estimate at this point, ADB's estimates will be developed and presented in the full proposals under this program.
Demonstration Potential at Scale	At a global level, the successful implementation of CFEI investments through the proposed vehicles shall contribute to an overall reduction of market risk premiums demanded by equity investors at the same time positive spillover effects which will benefit neighbor countries willing to increase the sustainability of their energy mix.
Development Impact	Significant benefits through job creation, reduction of carbon intensity, private sector demonstration, technology and knowledge transfer, energy security and reliability. Especially in countries short of power supply, income generating activities will be promoted by filling the gap in energy supply.
Implementation Potential	The Funds will ultimately target countries which already have in place the enabling policy, regulatory and institutional frameworks for the targeted type of investments to take place.
Additional Costs and Risk Premium	CFEI will enable investments that would not otherwise take place due to barriers and perceived risks.
Financial Sustainability	As long as the PEFs and investment programs are financially self-sufficient, they will not require additional contributions from the CTF to gain financial sustainability. By demonstrating successful cases and lowering perceived risks (and risk premiums demanded by investors), the CFEI will encourage the formation of more PEFs or other equity co-investors to commit resources without requiring the concessionality of CTF.
Effective Utilization of Concessional Finance	The principle of minimum concessionality will be employed.
Mitigation of Market	The concessionality of CTF funds will reduce the cost of

CTF Investment Criteria	Program Compliance
Distortions	capital for the investment vehicles. The underlying investments made by the PEF/CP3 will be made into projects and companies operating freely in developing country markets. Therefore, CFEI will not distort markets but rather, will stimulate sustainable infrastructure development.
Risks	Most of the anticipated risks are inherent in the transactions and operational processes of the PEFs and investment programs. Each regional program will assess its intrinsic risk factors and mitigation strategy before approval under the sub-program.

181. With regard to the AfDB, the CFEI will be available to all countries in which it operates, including CTF countries and non-CTF countries. This decision is based on risk management considerations, as investors' perceived risk in Northern Africa have greatly gone up following the Arab Spring, and on the lack of market absorption capacity if for instance, only current CTF pilot-countries were considered. ADB's CP3 Program can invest in all ADB developing member countries but can, given the much greater scope for deployment of funds within CTF pilot countries for Asia, if so desired for current CTF funding, limit investments to CTF pilot countries, while still ensuring an adequate deployment rate and risk diversification. IDB will be able to tailor investments to any definition the CTF TFC approves on eligible countries for the program (CTF-pilots, CIF-pilots, or those determined by potentially upcoming broader criteria).

182. For the purpose of risk management, PEFs and, in the case of CP3, direct investments will be carefully selected based on rigorous investment criteria. In the case of PEFs and to ensure alignment of interests, the investment managers will be required to participate in the equity investment and a hurdle rate and carried interest rate negotiated to ensure alignment of interests.

E. Funding Phase I

183. In the first Phase, USD 115 million is requested for the implementation of three regional programs in Africa, Asia and the Pacific, and Latin America and the Caribbean, by AfDB, ADB and IDB respectively. In addition, up to USD 3 million of preparation grants may be necessary for the MDBs to prepare their programs under the CFEI.

184. AfDB is currently structuring the African Renewable Energy Fund, a fund that will deploy equity in the development of renewable energy projects in Pan-African countries excluding South Africa. The Fund Manager has been selected and a first close is expected in late 2013 for an amount of USD 100-150 million. Therefore, if CTF fund is made available prior to financial close, AfDB will be able to seize an investment opportunity of USD 20 million. Given the limited availability of resources under the DPSP, the initial request for the first 12 months is of USD 20 million only.

185. ADB has initiated fund raising of CP3 and requests an amount of USD 75 million from CTF to establish a mezzanine co-investment tranche. Because of the transaction costs involved

in structuring this investment vehicle outside of the main CP3 fund (to meet the requirements of certain investors), we believe that this is the minimum size of such a contribution in Phase 1.

186. In the case of IDB, while the total PIES program size and request to CTF will be USD 50 million, in light of the limited initially available resources under the DPSP, the initial allocation for the first twelve months of the program could be a portion of this (minimum recommended would be of not less than USD 20 million), to support the most immediate investment opportunities. Such amount will be defined in the detailed program proposal to be submitted upon approval of the DPSP and CFEI program, and based on availability of DPSP funds.

F. Asian Development Bank Disclaimer

187. This document has been prepared to provide prospective investors with the opportunity to determine their preliminary interest regarding a product (“product”) that is being prepared by the Asian Development Bank (“ADB”) and may not be used or reproduced for any other purpose. This Program received ADB Board approval on February 15, 2012. This document is for informational purposes only and all information contained herein is subject to revision and completion. This document does not constitute or form part of an offer to issue or sell, or of a solicitation of an offer to subscribe or buy, any securities or other financial instruments, nor does it constitute a financial promotion, investment advice or an inducement or incitement to participate in any product, offering or investment. Any such offer will be made only by means of the product’s confidential private placement memorandum or such other offering documents as may be delivered by ADB to prospective investors and is subject to the terms and conditions contained therein and in the limited partnership agreement of the product. The information set forth herein does not purport to be complete. In addition, this document does not constitute nor shall it or the fact of its distribution form the basis of, or be relied on in connection with, any investment contract. Please note that the views, analyses and opinions reflected herein unless expressly stated otherwise reflect the perspective of the deal team and do not necessarily state or reflect the views of ADB. No representation, warranty or undertaking, express or implied, is given as to the accuracy or completeness of the information or opinions contained herein. No reliance may be placed for any purpose on the information and opinions contained in this document or their accuracy or completeness and nothing contained herein shall be relied upon as a promise or representation whether as to past or future performance. Certain information in this document has been derived from materials furnished by outside sources. ADB assumes no responsibility for independent verification of such information and has relied on such information being complete and accurate in all material respects. Nothing contained herein should be construed as legal, business or tax advice. This document contains confidential information and the recipient hereof agrees to maintain the confidentiality of such information. This document is intended solely for the information of the person to whom it has been delivered. Distribution of this information to any person other than the person to whom it has been originally delivered and to the advisers of such person who are also subject to a duty of confidentiality is unauthorized, and any reproduction or transmission of these materials, in whole or in part, or the divulgence of any of its contents to third parties, without the prior consent of ADB, is prohibited. The distribution of this document may be restricted in certain jurisdictions. The information herein is for general guidance only, and it is the responsibility of any person or persons in possession of this document to inform themselves of, and to observe, all applicable

laws and regulations of any relevant jurisdiction. This document is not intended for distribution to, or use by any person or entity in any jurisdiction or country where such distribution or use would be contrary to local law or regulation. In particular this document is not intended for distribution in the United States or for the account of U.S. persons (as defined in Regulation S under the United States Securities Act of 1933, as amended (the “Securities Act”)), except to persons who are both “qualified purchasers” (as defined in Section 2(a)(51) of the United States Investment Company Act of 1940, as amended (the “Investment Company Act”)) and “accredited investors” (as defined in Rule 501(a) under the Securities Act).