The Lab
The Global Innovation Lab for Climate Finance

Climate Development and Finance Facility: Pilot Proposal and Implementation Plan

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GOAL — *Promote development and finance of climate mitigation projects in developing countries*

IMPLEMENTING ENTITY — *Renewal Fund Managers, a joint venture between FMO and Phoenix Infraworks*

SECTOR(S) — *For Pilot: Renewable energy (wind, solar, hydro)*

PRIVATE FINANCE TARGET — *Project developers, private equity funds, infrastructure equity and debt fund investors*

GEOGRAPHY — *In pilot phase: Rwanda, Uganda, Kenya, Nigeria, Ghana, Indonesia, Philippines, India, Nepal, Nicaragua, Guatemala, Costa Rica, Panama. In the future: Low-income and lower middle-income countries*

CURRENT STAGE — *Pilot*

SUMMARY

In recent years, many developing countries have established supportive regulatory frameworks for private investment in infrastructure and renewable energy projects. However, finance for these projects remains a challenge due to severe delays from lack of expertise and prolonged negotiations with financiers and, because renewable energy projects require high amounts of capital expenditure, debt costs at construction can have a disproportionate effect on projects financial viability.

The Climate Development and Finance Facility (the Facility) addresses these challenges by combining three innovative investment facilities into one to finance projects in the wind, solar and hydro sectors. The Facility supports these projects through several stages to ensure projects get off the ground.

The Facility provides technical, environmental and social due diligence support at an early-stage. It then cuts out complex negotiations with multiple providers by financing a large part of construction costs with equity, and removes the need for debt finance at construction by allowing debt to be raised after the project is de-risked at lower cost. Finally, the Facility will unlock new capital through a pooled fund that may be appealing to institutional investors.

Phase 3 of The Lab has developed an illustrative financial model of the Facility and engaged with public and private investors on its detailed design in support of a potential implementation of the concept later in 2015. The analysis has revealed that the investment propositions are within market expectations provided adequate risk management systems are in place among the Facility operations. Under the current assumptions on risk and return distribution between the different investers, modeling downside scenarios shows a robust security of returns for senior investors in construction and re-financing, and acceptable upside profitability to equity investors. The expertise and experience of the fund manager and their role in the governance of each fund in the Facility will largely determine private investor participation in the fund.

For pilot implementation, the Facility requires USD 150 million in donor capital from governments. This will help to mobilize at least USD 2 billion of private or commercial rate capital within and outside the Facility, install approximately 300 MW of clean energy and reduce around 600 $ktCO_2$ annually. In target countries, it will reduce the cost of providing renewable electricity by between 9 and 18% depending on whether the technology is wind, solar or hydro.

The Lab is a global initiative that supports the identification and piloting of cutting edge climate finance instruments.

It aims to drive billions of dollars of private investment in developing countries.

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INTRODUCTION

The innovative merits and implementation challenges of the Climate Development and Finance Facility concept were outlined in The Lab's Phase 2 analysis. Since then, The Lab Secretariat has worked with a prospective proponent to:

- Develop a detailed conceptual financial model with waterfall cash flows in each of the funds
- Prepare a preliminary investor pack to engage investors and invite feedback
- Market-test potential governance and management arrangements, as well as sector and country focus proposed by a prospective implementer with a range of donor governments; development finance institutions and private investors
- Complete further assessment of how the Facility will intervene in markets where it is most needed as well as attracting new private investors.

This brief presents results of The Lab analysis of the Climate Development and Finance Facility (the Facility) and summarizes the Facility concept for endorsement by the public and private finance providers who are members or supporters of The Lab. It first outlines the Facility's pilot design, including relevant updates since Phase 2. It then provides an overview of the pilot's implementation pathway and concludes by outlining the role for public financial support.

PILOT DESIGN- PROGRESS AND LESSONS LEARNED

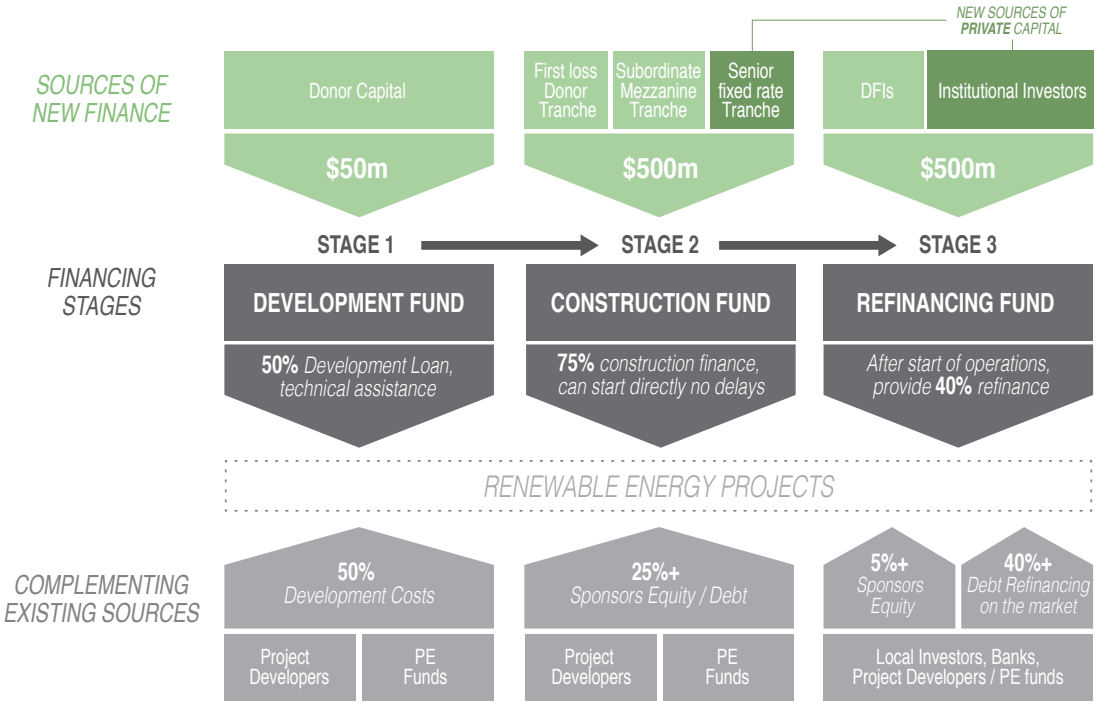
The design of the Climate Development and Finance Facility has been further refined to focus on specific countries and sectors, to address investor needs, and to define governance and management structures.

In recent years, many developing countries have established supportive regulatory frameworks for private investment in infrastructure and renewable energy projects. However, finance for these projects remains a challenge:

- Projects can fail or face severe delays due to lack of expertise in development and prolonged negotiations with financiers.
- Because renewable energy projects involve high amounts of capital expenditure, debt costs at construction can have a disproportionate effect on their financial viability.
- Finally, attracting new investors remains a challenge; institutional investors such as pension funds and insurance companies have few investments in infrastructure debt and none in low-income or lower middle-income countries.

The Climate Development and Finance Facility addresses these market deficiencies by combining several innovative investment facilities into one to finance climate mitigation projects, providing several stages of support to ensure that these projects get off the ground. At an early project stage, the Facility will provide technical, environmental, and social due diligence support through a Development Fund. The Facility then cuts out complex negotiations with multiple providers by equity financing a large part of construction costs through a Construction Fund. Finally, the Facility allows debt to be raised after the project is operational at a lower cost, while attracting new private investors through a pooled Refinancing Fund.

Figure 1: Overview of CDFF funding sources, project stages and stakeholder interaction



The Facility pilot has focused on specific sectors and countries

The Facility pilot focuses on wind, solar and hydro projects that are 25-75 MW or USD 80-100 million in total investment cost. The focus on financing these renewable

Table 1: Considerations for public and private investors in the Facility

Donor Funds - USD 150 million	Private Investors - USD 450 - USD 900 million*
- Must be aimed at overcoming specific market failures and resulting investment barriers - Public subsidy must be limited to the minimum needed to unlock private finance - Public funds must crowd in rather than crowd out or deter the private sector	- Attractive risk-adjusted returns - Sufficiently low political risk scores including a combination of OECD, Sovereign credit ratings - Market dynamics must be positive including regulatory framework and favorable pricing - Meets investment mandate and capital allocation frameworks
Fund Considerations: Identifying markets where donor funding would have a material impact as well as potential for creating sustainable, scalable, investment environments for private investors.	

energy projects will allow risk management and implementation to go more smoothly, while the focus on 25-75 MW projects allows the pilot to take into account a mix of technologies. However, future iterations of the concept may focus on energy efficiency, sustainable transport and water infrastructure respectively.

The Facility will not seek to be a seed developer but will target projects from three different groups: a) local developers and independent power producers requiring technical, commercial and organizational support in project development; b) local and international private equity funds with limited development resources that would complement existing fund-of-fund programs[1]; and c) original equipment manufacturers (OEMs) who may require limited resources for new project development in a new market.

The Facility's overarching focus is on attracting private finance for low and lower-middle income countries. In the course of The Lab's Phase 3, eleven low and lower-middle income and two upper-middle countries have been used as proxy markets. These countries are located in Sub-Saharan Africa, Southeast Asia and Latin American regions.[2]

- All of the focus countries for the Facility have relatively supportive renewable energy policy frameworks and market potential, with medium to long term policy targets and support mechanisms through feed-in tariffs or auctions (REN21 2014). Excluding India's plans to roll-out 364 GW of wind, solar and hydro capacity by 2030, the other markets combined hold a potential of 53 GW by 2030 (BNEF 2014; IRENA 2014). Ten out of the thirteen countries set power purchase agreements in USD or linked to the USD exchange rate, while on average, Independent Power Providers account for 34% of installed or planned capacity across the countries (Climatescope 2015; PLATTS 2014). For markets without denomination of power purchase agreement in USD such as India, Ghana and Nepal, the facility will seek to make use of hedging products.
- The focus countries also face challenges with project finance: Costs of medium-term debt range from 6% in the Philippines to 23% in Uganda in 2013 with an average range of 13-15% (World Bank 2015). In addition, across the focus countries proposed by the implementer (excluding India), renewable energy projects take an average of 31 months to reach financial close and a further 19 months to reach commissioning. Delays from 4 to 21 months are experienced. [3]

The balance of allocation for the Facility's project investments is intended to be split 70/30 in favor of lower- and lower-middle income countries. Investments in upper-middle income countries would aim to address market deficiencies that exist for example in the cost of capital or time to deployment. Across regions, no single region will account for more than 40% of total commitments. As of March 2015, a pipeline of seven projects in Sub-Saharan Africa have been identified through engagement with existing private equity and project developers in the target market, as well as through the proponents' network .

The Facility has better identified the needs of both public and private investors

While investors in the Facility will face typical risk factors[4] associated with country, sector, investment terms, and portfolio/ project management, there are several additional considerations for the Facility design as it works to attract both public and private investors.

For public investors, justifying use of public funds in countries that will also be acceptable to low-risk private investors requires built-in flexibility in the fund manager's mandate as shown in Table 1 (see section on public finance for discussion of these considerations).

For private investors reviewing a potential investment, the expertise of the fund management team and investment philosophy is a major factor. While the selection of an implementation team is beyond the scope of The Lab analysis,

1 For example the IFC Catalyst Fund and the Global Energy Efficiency and Renewable Energy Fund (GEEREF)

2 These include Kenya, Rwanda, Uganda, Nepal (LICs); Nigeria, Ghana, Indonesia, Philippines, India, Guatemala, Nicaragua (LMIC); and Panama and Costa Rica (UMIC).

3 Includes a sample of 32 wind, solar PV or small hydro projects financed or permitted since 2010 in the focus countries excluding India (BNEF 2015).

4 Investors will face typical risk factors that apply to fund investments, particularly those that relate to developing countries (such as political risks, legal enforcement, and currency) and renewable energy sectors (such as permitting, demand, and public acceptance). In addition, the investment terms of the Facility are illiquid and investors have no direct participation in day-to-day operations or management of the funds.

engagement to date has revealed lessons to be brought forward in any implementation of the Facility concept including:

- The prospective target returns for propositions within the Construction Fund were within the expectations of commercial investors. The 15% target annual return of the subordinate tranche and 8% target return[5] for the senior tranche is within the range of private equity limited partnership funds focusing on renewable energy in developing countries.[6]
- The seniority of investors in the construction fund needs clarity. As projects are re-financed, distributions are made to investors based on the tiered structure. However this may lead to investors in the subordinate mezzanine tranche receiving returns on excess profits before bullet capital repayments for the fixed-rate senior tranche investors are due (see next section on implementation risks and the appendix on current arrangements to increase security of senior lenders).
- Given country risks, the potential returns on offer from the Refinancing Fund may be perceived on the lower range of market expectations. The approximate 4% target return is 200bps above investment-grade European renewable project transactions, 100bps above North American renewable transactions, and similar or equal to transactions in Chile, India, and Peru (Blackrock 2015). But the focus of the facility on low and lower middle-income markets may increase perceived risks. The Refinancing Fund may also require a first-loss subordinate position or risk mitigation instrument such as insurance or guarantee to unlock private capital (see next section).

Other key stakeholders include local banks and investors who will be targeted in the re-financing stage and provide an added demonstration effect. Through the re-financing process, local banks and investors may acquire the skills in the long-term to manage performance and operational risks of renewable energy projects, enabling further lending or further risk adoption through construction financing over time.

5 For the purpose of this brief, given management fees will be guided by the interaction with both donors and investors and ultimately finalized only in the incoming months, all return estimates indicated are gross of such fees.

6 Danish Climate Investment Fund targets a 12% annual return over a 6 year period and the Africa Renewable Energy Fund has an 8% target return over a 10 year period (IFU 2015; Berkeley Energy 2014)

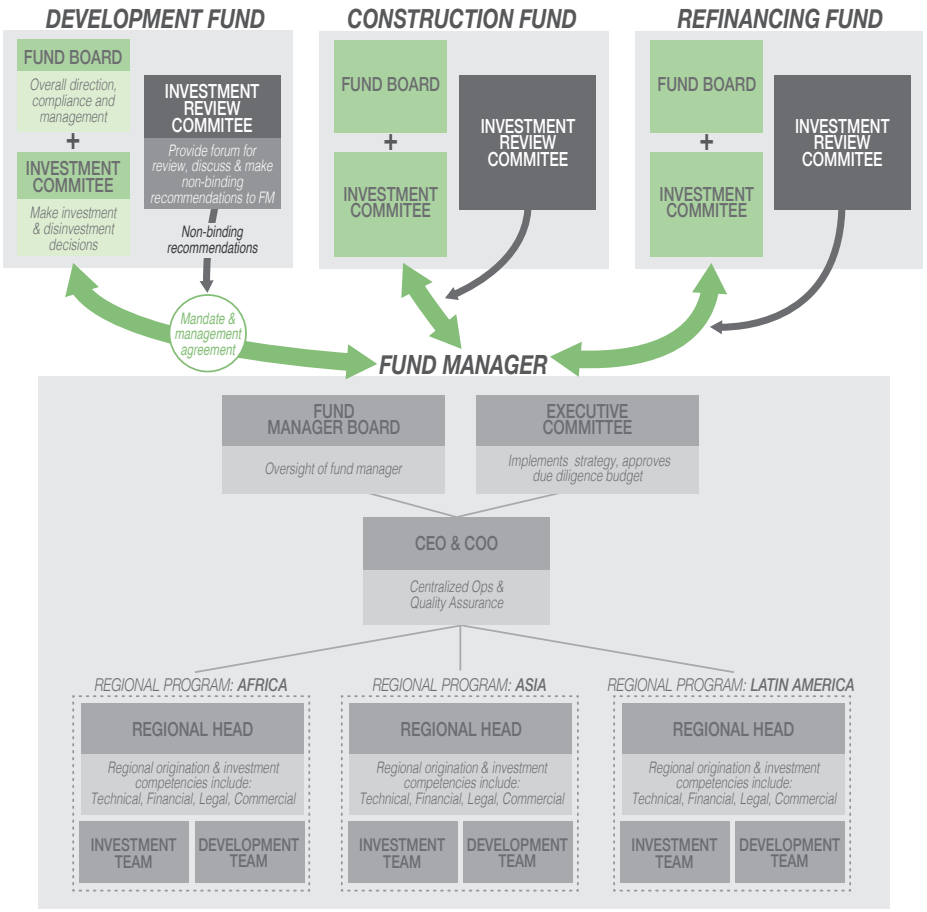
Facility management and governance details have been refined.[7]

A single fund management structure has been proposed that works across regions as well as implementing governance mandates for three separate funds. Figure 2 outlines how the fund governance and management arrangements can take shape as proposed by a potential implementer of the Facility, which may be actionable by Q4 2015. Key highlights include:

- Three regional offices of development and investment teams work across the individual funds.
- Each regional office is complemented by a centralized back office providing efficiencies in legal and administration requirements as well as quality assurance
- Due diligence budgets for prospective deals are approved by the fund manager but investment decisions are made by the Investment Committee of each Fund.
- Investment Committee and Fund Board will include one and two independent expert directors respectively that are appropriate to the mandate of that fund – either development, construction, or re-financing orientated.

7 The proponent and prospective implementer, FMO, has partnered with Phoenix InfraWorks to provide the fund structuring, fund raising, investment expertise, fund management experience and governance structures. A joint venture is proposed to manage all three facilities and staff the regional offices.

Figure 2: Potential fund governance and management structure (FMO/Phoenix 2015)



- Two regional heads will offer a counterpoint and analytical rigor to the other regional head submitting a proposal firstly, for due diligence in the Executive Committee, and later for investment decisions in the Investment Committee.
- An Investor Review Committee for each fund will operate in similar manner to a Limited Partner Advisory Committee that is common in private equity funds. It may review and provide non-binding recommendations to the Fund Manager on approving certain party-related transactions, key appointments, and changes to investment criteria.

The Facility capital structure remains robust under several downside scenarios

Stress testing the Facility capital strucuture under a conceptual financial model reveals that returns for investors in both the Refinancing Fund and the senior tranche of hte Construction Fund are robust to downside events which include underperformance of several projects.

As expected, the subordinate and non-profit tranches of the Construction Fund are affected negatively in such scenarios (see Appendix).

PILOT IMPLEMENTATION PLAN BEYOND APRIL 2015

One prospective implementer is planning to operationalize the Facility concept by Q1 2016 and has attracted public and private finance interest

The Lab has worked with a prospective implementer of the Facility concept to lay the groundwork to operationalize a pilot of the Facility by Q1 2016. The original proponent of the Facility concept, FMO, the Netherlands Development Finance Company, has recruited a private sector fund manager to help plan and execute the formal fundraising activity for a Facility pilot. The Facility would be expected to launch subject to the following milestones being reached:

- Confirmation of donor support Q2 2015
- Finalization of placement memorandum, fund raising material, due diligence package and FAQs Q2 2015
- Fundraising among private investors Q3/Q4 2015
- Commencement of investment activity in Development Fund Q1 2016
- Build out of operational capacity including regional offices in Africa and Southeast Asia Q1 2016First round of projects complete development, reach financial close and commence construction Q4 2016
- Start-up of regional office in Latin America Q3 2017
- Subsequent rounds of project investments ongoing

To attract private investors, implementation risks that will need to be addressed include:

- **Focus markets may be deemed too volatile or risky for private investors**, particularly in overcoming operational risks associated with the Refinancing Fund.

  Lab Members have advised one possible solution is to provide partial political and commercial risk guarantees for the Refinancing Facility that would include off-taker and political risks of host countries where projects are located. Another proposed solution from Lab Members is to provide built-in flexibility in the proportion of investments by low and lower-middle income, and upper-middle income countries, particularly in the initial years of the Facility in order to allow the fund manager to match available deal-flow and credible sponsors with investor risk appetite. For example, this solution may imply moving from an initial 50:50 proportion of projects in low and lower-middle income countries, against upper-middle income countries, to 70:30 over time.
- **The independence of each fund and investment committee may not be clear.** How different mandates and investor interests are achieved for each fund will have to be clarified. In particular, donor investors often operate by consensus while private investors are comfortable with majority decisions. Currently, the fund manager may have a majority representation on the Investment Committees. This is due to the presence of three regional office managers, which in turn may dilute the investment committees independence.
- **The distribution structure of the Construction Fund may raise perceived risks for the senior tranche.** As proposed, senior investors returns are secured by the overall value of assets in the fund while subordinate investors receive distributions on any excess value after the investment period (see Appendix). Another option to overcome this complexity may be to amortize capital repayments to the senior tranche as projects are re-financed and raise another round of senior debt to reinvest in more projects, although this may result in less projects to be initially financed.
- **The debt investments need to be easily placed in investor portfolios.** Although illiquid, these investments need to be listed on European exchanges as debt securities to allow them to be easily placed in investor portfolios.

ROLE & REASONS FOR PUBLIC FINANCE

There is a case for public support for the Climate Development and Finance Facility based on environmental and economic benefits of financing clean energy in developing countries.

As designed, the Facility could finance 9 projects with a total of 295 MW of renewable energy capacity and reduce 617ktCO_2 per year, based on a dataset of existing developing country projects. The levelised cost of electricity (LCOE) of projects in the dataset was decreased by between 9 and 18% from a business as usual case where more expensive debt is leveraged at construction, thereby improving the feasibility of developing countries to adopt more clean power.[8]

The Facility is also expected to have development benefits, including:

- Job creation in project development, construction, and operation. The construction, and operation and maintenance of projects funded through the Facility have potential to create an estimated 7560 jobs.[9] This will facilitate wider economic co-benefits and sectors in the project supply chain.
- Multiple co-benefits. Clean energy and water infrastructure provide health co-benefits and meet basic needs of populations, often in rural areas with low access to this infrastructure.
- Larger project pipeline. Transfer and build-up of new technologies and knowledge through the Development Facility could lead to a larger pipeline of projects to be developed on a standalone capacity. For new technologies in a given country, the Facility can demonstrate to private investors that such projects have a clear business case.

For start-up, the Facility needs USD 150 million of public finance. These funds would play a crucial role in increasing deal-flow for renewable energy projects and mobilizing USD 1.8 billion of new private construction and re-financing investment by:

- **Getting projects off the ground:** The Facility aims to increase deal-flow first by improving bankability through technical support, and second, by cutting negotiations to reach financial close. Investment costs at construction are 7-21% lower due to the absence of debt service coverage at construction.
- **Mobilizing new and additional private finance:** Institutional investors such as pension funds and insurance companies, both domestic and international, have little exposure to infrastructure investments, and green infrastructure as a subset of this (Nelson and Pierpont 2013). Of notable green infrastructure investment by OECD based institutional investors, the focus has been on equity funds and emerging markets such as Brazil, China, Mexico, Chile and South Africa.[10] The Facility will offer new investable securities for institutional investors and local banks in low- and lower-middle income countries that will allow these investors to achieve a greater exposure to pre-operational, operational, and performance assets. Over time this will drive a transition to a more local and private investment market.
- **Crowding in existing flows of private capital from local and regional financial markets:** In many of the country markets, there may be existing private equity sources or funds from developers. Local or international banks and institutional investors that operate in these markets will be crowded in during the re-financing stage at a cheaper cost of capital than at construction.

The replication and scale-up of the Facility will likely require less public finance over time.

The Facility aims to provide a demonstration effect on quick and simple renewable energy project financing through the equity-only approach for construction. In the short- to medium-term, it is expected that other equity providers may adopt the construction financing approach to a larger degree than is currently the case, having observed that an active re-financing market is available. This would reduce the refinancing premium that would be embedded in their returns if they were to follow this approach today. In the longer term, as local institutions become familiar with technology performance and project finance, it can be anticipated that more construction risks may be adopted over time by local commercial banks and the need for public funds in instruments such as the Facility will be reduced.

For a pilot utilizing USD 150 million of donor capital across low- and lower-middle income markets, 'sunset' conditions or exit strategy on individual markets may be proposed. These would include inter alia, reasonable costs of capital for renewable energy projects at construction that allow it to compete with conventional fuels; flows of private capital from institutional investors into re-financed renewable energy infrastructure assets; and an improved project development environment with timely facilitation of due diligence. These conditions may be measured through qualitative indictors and investor surveys.

8 Ranges reflect different technologies, construction times and whether construction debt in a BAU case is 11% (assumed in model) and 13% (World Bank indicator for lending interest rate in focus countries).

9 Based on data for South Africa available in IRENA 2013

10 The Danish Climate Investment Fund has to date invested in Maldives, China and Brazil. See also Inderst, G. and Stewart F. 2014. Institutional Investment in Infrastructure in Emerging Markets and Developing Economies. Public-Private Infrastructure Advisory Facility (PPIAF), Washington D.C. for an overview of country destinations.

APPENDICES

Results of conceptual modeling

Key points for the reference scenario

The modeling results presented here represent conceptual modelling of the Facility structure and do not indicate actual returns or results provided to potential investors in the Facility. A simulated conceptual financial model of the Facility was built based on a dataset of projects that could resemble a project pipeline with average rate of returns between 15-18%. The data does not reflect actual projects that may populate the project pipeline of the Facility. For the Construction Fund, several options for the distribution of returns amongst the different investors have been tested to find a balance between the following goals:

- Donor investors would prefer the facility to engage with the largest amount of investments possible given its portfolio, delaying distributions and recycling capital as much as possible;
- Senior investors would require a comfortable level of confidence that their returns would be attained even in certain downside scenarios, hence maintaining sufficient collateral in the fund;
- Unsecured investors instead would need to be compensated for the higher risk they are willing to take, hence preferring early distributions from successful investments as they are originated.

In the proposed solution, capital would be recycled into new projects but only for a limited amount of time (the "investment period") at the beginning of the fund's life to ensure the highest number of clean energy MW are installed given the initial portfolio. Senior investors' returns would be guaranteed by the overall value of the Construction Fund (hence not a single investment). Subordinate tranche returns are enhanced by distributions made from successful investments as soon as the investment period is closed and provided that the value of the overall fund is equal or higher to the payments expected by senior tranche investors.

Downside scenario analysis

Facilities' returns to investors have been tested against a set of downside scenarios simulating higher costs, reduced power generation or reduced value of the power sold. Different scenarios have been run for shocks occurring during construction phase and those occurring after refinancing transactions have been completed (Table A1). As expected, subordinate tranche returns and first-loss tranche capital recovery are the variables affected the most in downside scenarios, while senior tranche returns are insulated from shocks in most cases but for the more drastic ones, affecting a large amount of assets in the portfolio.

As long as risk event occur before refinancing transactions, returns to the Refinancing Fund investors are not affected (as refinancing terms are always set on the proven 24 months track record post-commissioning). Conversely, Refinancing Fund returns can no longer be guaranteed when risk events (such as a tariff renegotiation) occur after the refinancing transactions have been completed.

Both the reference and downside scenarios illustrate returns gross of management fees.

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Table A1. Results of modelling the reference case and downside scenarios

	Reference Case		Projects fully financed	RE installed (MW)	CO2 reduced (kt/yr)	Capital Recovery T1 CF	Investor returns T2 CF	Investor returns T3 CF	Investor Returns RF
			9	295	617	100%	21%	8%	4%
Pre - Commissioning Risk Scenarios	Scenario 1: Lower Generation	30% lower generation for 5 projects	9	295	503	95%	12%	8%	4%
		30% lower generation all assets	9	295	432	72%	7%	8%	4%
	Scenario 2: Lower Tariff at Commissioning Day	50% lower tariff for 5 projects	8	275	584	17%	9%	8%	4%
		50% lower tariff all projects	8	260	538	0%	2%	8%	4%
	Scenario 3: Higher Construction Costs	50% higher costs for 5 projects	6	195	451	100%	11%	8%	4%
		Higher costs all projects	6	200	456	100%	9%	8%	4%
	Scenario 4: Delayed Commissioning	2 year delay for 5 projects	8	270	573	100%	15%	8%	4%
		2 years delay	7	250	539	100%	13%	8%	4%
	Scenario 5: Expensive Refinancing	4% excess refinancing cost	9	295	617	100%	15%	8%	5%
		6% excess refinancing cost	9	295	617	100%	13%	8%	6%
	Worst Case Scenarios	50% lower tariff, 2 years commissioning delay and 6% excess refinancing spread	7	235	494	0%	0%	8%	5%
		50% lower tariff, 50% higher costs and 30% lower generation	5	160	260	0%	-6%	2%	3%
Post-Commissioning Risk Scenarios	30% lower tariff for 5 projects		9	295	617	100%	19%	8%	4%
	50% lower tariff for 5 projects		9	295	617	100%	19%	8%	3%
	5 projects cancelled		4	100	183	100%	19%	8%	-5%

Note: Scenario results represent conceptual modeling of the Facility structure and do not indicate actual returns or results provided to potential investors in the Facility.

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