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# Long-Term FX Risk Management Pilot Proposal and Implementation Plan

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**GOAL** — Increase low-carbon investment in developing countries by providing foreign exchange and interest rate risk management instruments to projects and entities investing in climate relevant sectors

**IMPLEMENTING ENTITIES** — The Currency Exchange Fund Management Company (TIM) and the International Finance Corporation (IFC)

## SUMMARY

Renewable energy and other forms of clean infrastructure are capital-intensive investments that require long-term financing to match long operational lifetimes and payback periods. In countries with underdeveloped capital markets, the only long-term financing available at a reasonable cost is denominated in hard currency like the dollar or euro. Project investors must therefore enter into risky deals where the revenues of a project are in one currency while repayment obligations are in another. This means that investors face increased uncertainty over financial outcomes, which can tip the balance and lead to good projects not being pursued.

By providing the tools for investors to lock-in long-term finance in local currency, the Long-Term FX Risk Management instrument helps to make more projects viable and unlocks new investment in projects that reduce greenhouse gas emissions and increase climate resilience.

Phase 3 of The Lab focused on developing the operational and financial structure of the instrument, defining products that could be offered, and identifying potential areas of pipeline development. The two proposed implementing entities have refined the instrument design and arrived at a structure that

**SECTOR(S)** — Renewable energy, energy efficiency, water, and low carbon transport

**PRIVATE FINANCE TARGET** — Private debt and equity

**GEOGRAPHY** — Global

**CURRENT STAGE** — Ready for pilot

can reach more potential users. In the refined structure, The Currency Exchange Fund Management Company (TIM), through a subsidiary, will offer long-term fixed and inflation linked cross-currency swaps and interest rate swaps while the International Finance Corporation (IFC) will provide direct local currency loans and cross currency swaps. The operational and financial structures leverage the institutional capacities of the implementing entities and build on their experience, allowing for a quick deployment while reducing implementation risks and transaction costs. This means that a pilot could be operational in a year or less.

The next step for pilot implementation is to secure a total of USD 250 million in risk capital for two first loss facilities. These will support the issuance of swaps and local currency loans in countries whose financial sectors lack capacity for long-term local currency financing and hedging. The pilot could provide as much as USD 1 billion in hedging capacity and support USD 1.5 billion of clean investment projects. The instrument will also support the long-term development of local financial markets and help increase commercial offerings of foreign exchange rate risk management products, contributing to transformational change and climate-friendly development.

**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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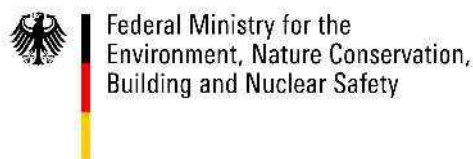
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|----------|--|
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| Region   | Global emerging markets  |
| Keywords | Currency Risk, Interest Rate Risk, Counterparty Risk, Foreign Exchange, Risk Management          |
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## INTRODUCTION

The Long-Term FX Risk Management instrument,<sup>1</sup> formerly the “Long-Term Currency Swap” would give investors in developing countries unprecedented access to foreign exchange and interest rate risk management products. The proposal has been developed by The Lab Secretariat in collaboration with The Currency Exchange Fund Management Company (TIM) and The International Finance Corporation (IFC) who are proposed as the implementing entities and would work together to pilot this instrument. Since Phase 2, The Lab Secretariat has worked with IFC and TIM to:

- Refine the business model of the instrument and client offerings
- Specify the role of each implementing entity and a collaboration framework
- Define operational structure, legal, and governance frameworks
- Refine the financial model and funding needs
- Identify potential areas of market demand and pipeline development
- Reach out to potential funding partners

The outputs of Phase 3 are presented in this brief as well as in two draft memoranda – one for each of the implementing institutions - that can serve as template agreements for further development in partnership with interested funders. The memoranda are available upon request.

This brief is organized into three sections. The first section provides background on the design of the Long-Term FX Risk Management instrument including progress and lessons learned since Phase 2. The second section discusses the implementation plan and the last section discusses funding needs and the rationale for public finance.

## PILOT DESIGN – PROGRESS AND LESSONS LEARNED

*The instrument aims to drive new climate investment by providing a set of tools that can be used by climate friendly projects to reduce exposure to foreign exchange and interest rate risk in low and middle-income countries. The design was refined since Phase 2 to reach more potential users and better suit the needs of clean infrastructure projects.*

Capital-intensive investments in renewable energy and other forms of clean infrastructure require long-term financing to

correspond with long operational lifetimes and payback periods. There is limited availability of funding sources in countries with underdeveloped capital markets, requiring investors to utilize financing arrangements often denominated in hard currency like the dollar or euro. Sub-Saharan Africa is a prominent example where, except for South Africa, local capital markets are not sufficiently deep to offer project finance in local currency or offer suitable hedges for currency risk (Donnelly, 2015). Project investors will seek a higher return to compensate for the higher perceived risk and this can tip the balance of financial feasibility with the result of good projects not being pursued. Inadequate currency and interest rate risk management can also lead to greater project failures, adverse impacts on consumers and systemic risk on financial systems (Gray & Schuster, 1998), (EU, 2011).

**The Long-Term FX Risk Management business model has been refined to better address needs in frontier and emerging markets and to reach more potential users.**

The design of the instrument has been significantly refined since Phase 2 of The Lab. It leverages the experience of the proposed implementing entities and provides a suite of products that allow a wide range of projects and entities to manage their foreign exchange (FX) and interest rate exposure. The instrument now offers different types of swaps to reduce costs and accommodate a wider range of projects as well as a local currency lending product that bundles swaps with a USD loan provided by IFC to help clients who may not wish to enter into derivative contracts.

The design also safeguards the use of public funds by incorporating strict additionality requirements in determining the portions of a transaction that can be supported.

In a pilot, IFC and TIM would work together to implement the instrument, collaborating to develop a pipeline and enter into joint transactions where appropriate. Their roles are complementary. Each will fill needs in the market by offering a specific set of tools that can be put together to structure a transaction (Figure 1)

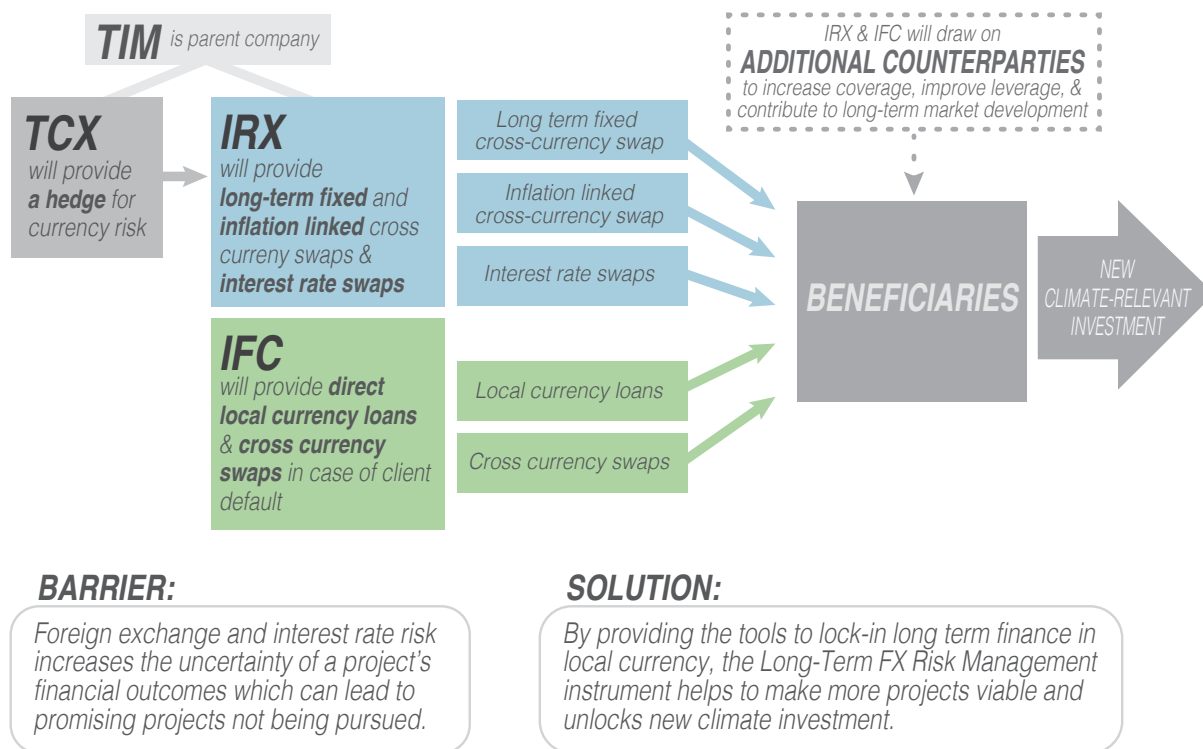
### **TIM – Provide Long-Term Foreign Exchange (FX) Swaps by Addressing the Interest Rate Component of a Swap**

TIM would establish a separate subsidiary – the Interest Rate Exchange (IRX) – that would use a donor funded first loss tranche to back a portfolio of interest rate swaps. The focus is on interest rates because this is where donor additionality is seen. Currency swap pricing is based on expected changes in the level of interest rates, changes in swap spreads, changes in the shape of the interest rate yield curve, and exchange rates (MFX, 2015). By combining an interest rate hedge with a currency swap, a longer-term swap can be priced. The Currency Exchange Fund (TCX) managed by TIM already offers FX swaps but at shorter tenors so addressing the interest rate component would allow offering tenors of ten years<sup>2</sup> or more.

<sup>1</sup> The name of the instrument was changed in Phase 3 to reflect a change of focus to a more comprehensive set of tools for FX risk management.

<sup>2</sup> Longer tenors could be made available at a future date

Figure 1: The instrument offers access to a wide range of FX risk management solutions



Instrument offerings<sup>3</sup>

1. **Long-term fixed FX swaps** offer clients fixed payments in a currency pair at tenors up to ten years to better match the operational lifetimes of renewable energy and clean infrastructure projects.
2. **Inflation (CPI) linked FX swaps** decrease swap costs by indexing payments to inflation. This is ideal for a renewable energy project that can adjust revenues to inflation.
3. **Interest rate swaps** will also be offered directly to clients as an additional benefit of the instrument. This allows clean investment projects to lock long term financing at a fixed rate.

**Use of donor funds:** Donor risk capital will only be used to back the interest rate component of a swap transaction to enable the underwriting of long-dated swaps for eligible counterparties such as climate friendly and adaptation investments.

**Financial model and leverage projections**

Table 1 presents projections of hedging transactions and the required capital to support such a deal flow. Deal flow (and leverage of donor involvement) depends on the following key factors: (a) the risk appetite of the fund (b) the portfolio share of fixed rate hedges (versus CPI linked, which require less capital) (c) the average tenor of the portfolio (the longer the less leverage) (d) the possibilities to re-hedge with quality counterparties.

3 Offerings are subject to additionality and eligibility criteria based on market served, project type, credit quality, and ESG standards. Additional information is available in the draft memoranda.

Several scenarios have been tested with historic data with a model portfolio on a time horizon of five years. These simulations show that the success of the facility – interpreted as the leverage of donor resources it can generate – will depend critically on a few assumptions. First of all, on return performance, which reflects the ability to quantify and correctly price individual deals and achieve good portfolio diversification. Second, on the average tenor of hedged transactions – the longer, the more capital is consumed, the less leverage is possible since these types of deals are considered to have more duration risk. Third, the composition of the portfolio in terms of its share of fixed versus potential inflation linked floating rate transactions.

Table 1 considers three scenarios, where the difference between the scenarios is the behavior of short-term interest rates vis a vis the long term local fixed interest rates, keeping in mind that for a portfolio of such swap transactions a positive outcome would result from short interest rates remaining below the long-term rates fixed in the terms of the transaction. Higher leverage is achieved in such scenarios, as profits are recycled in more swaps with the portfolio being able to facilitate a larger cumulative transaction volume with the same initial capital base. The results indicate roughly, that in a period of five years, assuming very simple capital restrictions and a reasonable risk appetite that the possible leverage range is around two to five.

Table 1: Projections of Hedging Demand and Required Capital

|                      | Favourable scenario | Moderate scenario | Slow scenario |
|----------------------|---------------------|-------------------|---------------|
| Carry/Rate of return | 4.8%                | 2.1%              | -0.7%         |
| Max leverage         | 4.8                 | 3.2               | 2.6           |

## IFC - Credit Risk Mitigation on Local Currency Financing and Hedging

IFC proposes to use donor funds to partly cover first loss on climate-smart projects that are funded in local currency or funded in hard currency then subsequently hedged into local currency. A first loss guarantee structure would help reduce overall credit risk for the originator and thus improve credit risk pricing on projects that could otherwise not materialize due to prohibitive costs. The proposed facility focuses on two products —direct local currency loans and cross-currency swaps.

### Instrument offerings

1. **Local currency loans** bundle a USD-denominated loan with a cross-currency swap to directly offer a local currency loan to clients. From IFC's experience, some clients, especially in frontier markets, prefer a local currency loan to a swap instrument as they are inexperienced in trading and booking derivatives or local regulation prevents them from entering into derivative contracts
2. **Cross currency swaps** will be provided directly to clients. IFC would underwrite the swap and re-hedge its FX exposure with IRX/TCX or with commercial counterparties. Donor funds will guarantee only the credit component. Such coverage will reduce credit fee charged on the trade and thus improve all-in cost of hedging for the client.

**Use of donor funds:** The proposal entails use of donor-funded first loss to improve the risk profile of eligible climate-smart projects funded in local currency or through cross-currency swaps and to thus reduce credit risk charges.

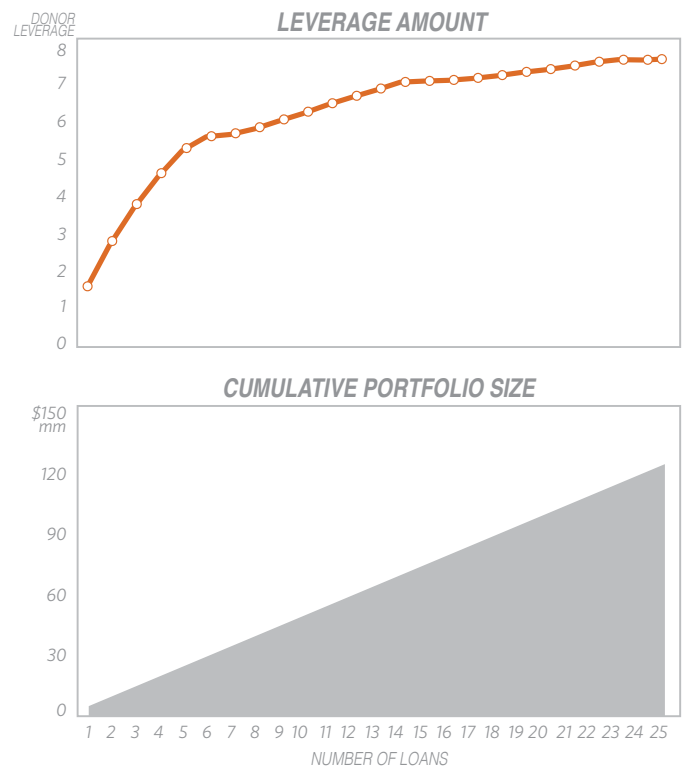
### Financial model and leverage projection

In line with its Blended Finance program under which IFC already manages donor funds on delegated authority basis, as a prospective implementer, IFC would 1) evaluate minimum required concessionality on a project-by-project basis, and 2) share (for its own account) in the first loss piece in order maintain proper alignment of interest. While the same principles apply in terms of minimum concessionality and IFC participation in the first loss, the two products (local currency loan and cross-currency swap) are priced using different models as the products have different loss profiles in case of a credit event. Therefore, the following discussion for the financial modeling is divided for the local currency loan product and the cross-currency swap product.

### Local currency loan

IFC relies on an in-house financial model to simulate default events and recovery amounts of each loan included in the facility, taking into account loan sizes, maturities, credit ratings, correlation among loans, and first loss provided by donors and IFC. The model produces expected loss amount and break-even pricing spread for the investment. In case of this facility, the first step would be to analyze minimum spread discount

Figure 2: Leverage of the IFC first loss tranche for local currency loans



required for an eligible project to materialize. Once the spread discount is established, the model is used to solve for the size of first loss required by donors to achieve such spread reduction. The first loss guarantee will be influenced by the credit quality of projects already included in the facility, their size, and tenor; therefore at this stage results can only be simulated. Figure 1 is an illustration of the facility structure under current assumptions:

1. Donors provide 75% of the first loss while IFC covers the remaining 25%
2. First loss guarantee increase is sized so that each additional loan is priced with a 50% reduction in expected loss component of credit spread pricing

The first loan project in the facility will require the highest first loss as there is no loss distribution benefit. However, as more loans are added into the facility, less first loss will be required as a share of the total loan portfolio to achieve an equivalent reduction in spread pricing, due to diversification effects. In Figure 2, projected leverage of the facility for local currency loans is shown.

Table 2: Main Features of IRX and IFC Facilities

| Interest Rate Exchange (IRX)        |   | IFC - Credit Risk Mitigation on Local Currency Financing and Hedging  |
|-------------------------------------|---|---|
| <b>Legal/ Operational structure</b> | The IRX will be set-up and managed by the TCX Investment Management Company (TIM) providing the benefit of their established experience and transaction management strength while keeping the initiative separate from TCX's business and making it possible for the IRX to stay focused on its own strategic targets. Donors are asked to take an equity like majority position, which takes full up and downside risks. | As it is standard for its Blended Finance operations, IFC would set up a trust fund for investments to receive funding from donors. IFC would manage the donor funds on a delegated authority basis following its existing operational procedures and approach for Blended Finance and allocating funding to investments based on agreed eligibility criteria.  |
| <b>Governance</b>                   | The governance structure will consist of a Supervisory Board (SB), which is appointed by donors and the TIM and a Macro Economic Advisory Committee which will report directly to the Supervisory Board. The SB will decide on pricing policy, eligibility and reporting issues.  | IFC blended finance principles and governance would apply to the donor-funded tranche of the facility. These include; <ul style="list-style-type: none"> <li>- High level of transparency</li> <li>- Standard of care for donor managed resources</li> <li>- Managing potential conflicts of interest, segregation of funds, separate investment staff, transparency and public disclosure</li> <li>- Reporting to the Board</li> </ul> |

### Cross-currency swaps

The standard approach at IFC to pricing client risk management transactions is a simulations-based model that relies on prevailing market data (interest rate and FX curves, volatilities and correlations) to estimate the expected positive exposure under the swap transaction. Expected positive exposure (a fraction of the notional size of the transaction) is thought of as a bullet loan to the client, on which IFC charges a credit spread commensurate with the credit quality of the underlying project. The present value of the credit spread applied to the expected positive exposure is prorated on the swap transaction's notional profile to arrive at the credit charge.

Given the stochastic nature of exposure under swap transactions and the complexities of modeling a portfolio of different (and often illiquid) currency swaps, IFC will not take a portfolio approach. Instead, each swap will be evaluated on a stand-alone basis to determine the first loss required for the minimum necessary reduction in credit charge. Mobilization in this structure is achieved simply through the nature of the product – expected swap exposure is only a fraction of the notional size. As a result, booking a relatively small exposure facilitates hedging of a larger transaction. As the credit charge is a function of swap characteristics such as tenor or currency volatility and also of project credit risk, again, at the current stage an example can only be an illustrative simulation. Assuming a long-dated swap, credit charges could be reduced by half with a first loss guarantee in which donors are exposed to 75% of the mark-to-market in case of default up to a cap of 10-20% of the swap notional amount and IFC is exposed to 25% of the first loss and all the loss above the donor cap. For a 50% reduction in credit charges, donor guarantee could mobilize a transaction 5-10 times larger than their guarantee, depending on the transaction characteristics.

### Example transactions

The instrument offers a wide range of offerings between the two institutions. This provides clients with a range of possibilities for structuring transactions to accommodate their needs. Below are some example transactions that could be undertaken:

1. A client requests a CPI-linked long-term swap to hedge long-term debt for a renewable energy project in a country in Sub-Saharan Africa where no commercial swap providers exist. TCX/IRX are able to provide the long-term swap, working together to hedge the FX and interest rate components.
2. A client in a country that limits derivatives trades approaches IFC for a local currency loan. IFC cannot take currency risk so it provides a USD loan and hedges its currency exposure directly with TCX/IRX. The client can now get a local currency denominated loan.
3. Finally, a client requests a long-term swap to hedge project debt on a PV plant in India where commercial swap providers exist but will not provide swaps to institutions with a credit rating below AAA. IFC steps-in, using its own AAA credit rating to act as the counterparty to the commercial provider and guaranteeing credit risk on the swap transaction for the client.

### Structure, financial and operational models, and governance arrangements have been outlined

The pilot would be operationalized through two facilities. A summary of the structure and governance model of each facility is provided in Table 2 below. On the left side is the IRX, which would be established as a subsidiary of TIM to direct donor funds exclusively for addressing the interest rate component of swap transactions. On the right side is the IFC facility, which

would establish a trust fund for donor funds within its Blended Finance operations.

Additional operational details are described in the two draft investment memoranda that are available upon request from interested funding partners.

### Pipeline development areas have been identified

Together with the prospective implementers, The Lab Secretariat carried out a market assessment to identify niches and estimate potential global market demand. Table 3 outlines three promising market areas. These will be the initial focus of pipeline development for the instrument. A more detailed characterization of one of these market areas (“Resilient Utilities”) is provided in the appendix discussing a potential “typical” transaction.

## PILOT IMPLEMENTATION PLAN BEYOND APRIL 2015

*The prospective implementing entities could operationalize the Instrument by late 2015 and have attracted public and private interest.*

Once a funding commitment is made, the instrument could be operationalized in less than one year. Deployment would take a few years as it will take time to reach potential clients and familiarize them with the offerings proposed. The next steps after April 2015 are:

- “Road-show” and fund-raising (Q2 2015) – Representatives of the proposed implementing entities would visit funders to raise funds for implementation.
- Finalize operational/financial structure (Q3 2015) – In partnership with potential funders, establish more

detailed eligibility and additionality criteria as well as operational and reporting frameworks.

- Finalize and sign legal memoranda (Q3 2015)
- Continue pipeline development (Ongoing) – Continue talking to potential clients and build project pipeline to prepare for launch.
- Set up operational entities (Q4 2015) – TIM would establish a new subsidiary and IFC would establish a new trust fund
- First transaction (Q4 2015/ Q1 2016)

## ROLE & REASONS FOR PUBLIC FINANCE

**For start-up, the pilot needs a USD 250 million risk capital from donor finance sources, which can leverage between three and four times more in additional finance.** The funds would be used for:

- A proposed USD 50 million first loss tranche to partially guarantee a portfolio of local currency loans and cross-currency swaps through IFC. IFC would also participate in the first loss tranche to ensure alignment of interest. This is expected to generate USD 300 million worth of financing extended by IFC to relevant projects over time.
- A proposed USD 200 million risk capital to back a portfolio of cross-currency swaps through IRX. These amounts are expected to support USD 600 million – USD 800 million worth of transactions.

**There is a case for public support for the FX instrument based on the environmental and economic benefits it provides.** A simplified scenario was drawn that focused only on wind and solar projects to provide an estimate of potential impacts of a pilot.<sup>4</sup> In this scenario, with USD 250 million in donor risk capital, the pilot could provide a total hedging capacity of

USD 915 million. This **could support USD 1.45 billion in total project value with potential GHG reductions of 1.7 MtCO<sub>2</sub> per year and a cumulative total of 39 MtCO<sub>2</sub> over the operational lifetime of the assets.**<sup>5</sup> The instrument is highly versatile and can also support energy efficiency, clean transport, water infrastructure, and other types of mitigation and adaptation projects.

Post-pilot, the instrument is highly scalable and flexible in terms of geographic and sectoral reach and will also **contribute to financial market development and transformational impacts, unlocking additional investment.**

<sup>4</sup> In reality the instrument would support a much wider range of projects including energy efficiency, clean transport, water and other clean infrastructure.

<sup>5</sup> Scenario assumptions and results are provided in the appendix

Table 3: Potential market niches for FX instrument

| Market area                             | Description   | Mkt. opportunity | Effort to market |
|---|---|------------------|------------------|
| Local currency PPAs and Feed-in Tariffs | Projects with debt in hard currency and revenues in local currency resulting in FX risks.   | High (USD 5 bn+) | Medium           |
| Resilient utilities                     | In cooperation with local commercial banks, offer rolling multiyear hedging programs to reduce FX exposure. This will help utilities, especially those in low-income countries, become more financially resilient and increase investment that leads to greater electrification, increased grid stability and reduce tariff volatility. The product offering will be directly tied to new or existing renewable energy investments. | High (USD 5 bn+) | Medium           |
| Green credit lines                      | Local currency green financing lines in areas such as energy efficiency to be provided in cooperation with DFIs and local commercial banks  | Med. (USD 1-3bn) | High             |

## APPENDICES

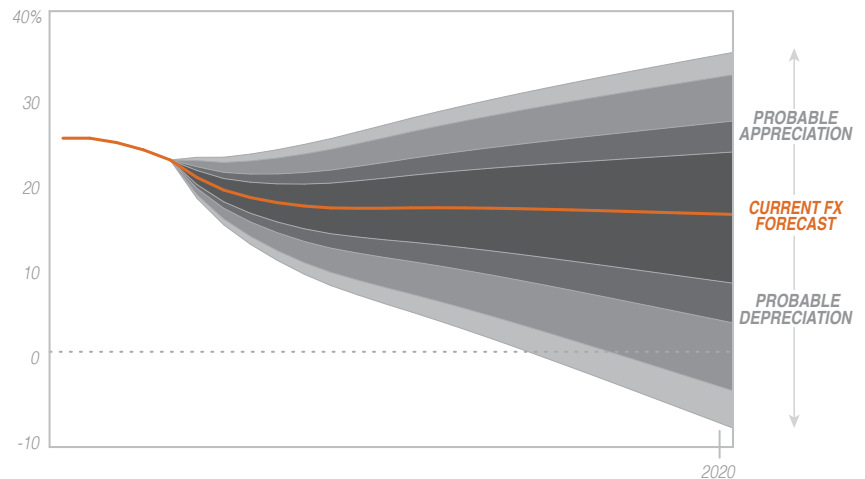
### Case Study: Managing the FX Risk of a Sub Saharan African Utility

In several low- and middle-income countries (e.g. Kenya, Nigeria, Rwanda, Uganda), high political risks, currency instability, and under-developed financial markets make it impossible to finance projects in local currency with the only financing options being hard currency offshore markets. Hence, in order to attract private project developers, many state-owned utilities offer hard currency denominated generation tariffs accepting significant currency risks. While local distribution tariffs are set in local currencies, these utilities purchase most of the power and import fossil fuels denominated in hard currencies.

In this case study – based on the current energy portfolio of a Sub-Saharan state owned utility - almost all power purchased by the utility is generated by hydropower sources (with more than half purchased in hard currency) while the balance is generated by thermal plants running on imported fuels and, in a smaller part, biomass and other renewables. Thus, the utility is exposed to two significant risks: hydrology and currency risk. Hydrology risk (e.g. droughts) would increase the power sourced from expensive thermal generation, increasing at once cost of generation and the foreign currency exposure via dollar denominated imports of fossil fuels. Conversely, local currency devaluation risk would increase the value of long-term liabilities of the utility (hard currency tariffs and fuel imports), relative to the value of the revenues received from the distribution of power, hence decreasing the utility operative margin (the value of power sales minus power purchases). Figure 3 shows the expected utility operative margin (as percentage of total sales) estimated using the current exchange rate forecast and its uncertainty represented by different confidence intervals (Mantis, 2015). With the current energy portfolio and tariff setting mechanism, in cases of a strong devaluation of the local currency, the utility operating margin could deteriorate significantly, and turn from positive to negative. In order to maintain a positive and sufficient operative margin (also able to recoup the utility's running costs and debt service obligations), the local currency tariff charged to electricity users would need to increase. Moreover, in part of the currency risk, the utility faces interest rate risks.

In such a context, the proposed facility could offer long-term FX swaps to the utility to mitigate the overall exposure to exchange rate fluctuations, potentially matching the horizon of the utility's liabilities (e.g. power purchase agreements with maturities typically longer than 10 years). Transaction costs would be reduced as the facility would interact with a single counterparty (the utility), while the credit risk in the transaction could be mitigated by either a public guarantee from the local government or a third party guarantor, such as a political risk insurance provider. By utilizing this instrument, this utility could

Figure 3: Expected utility operative margin from power distribution and currency uncertainty



Source: CPI estimates and Mantis FX Forecast

stabilize its income, improve planning and lower its costs of finance, enabling it to pass lower costs and improve energy access for its consumers.

### Impact assessment of FX Risk Management Instrument: Assumptions and Results

A simplified scenario was defined to estimate potential impacts of the instrument. In this scenario, the instrument was used to support a project portfolio of onshore wind and solar PV although in reality the instrument would support a much wider range of projects including energy efficiency, clean transport, water and other clean infrastructure. The assumptions and results for this simplified scenario are provided below.

The impacts of the instrument are dependent on the following key assumptions:

#### Portfolio composition

- Hedging tools provided - each offering has different leverage potential as some require more donor risk capital than others e.g. fixed swaps require more risk capital than cpi-linked swaps.
- Portfolio share of projects – capital costs of technologies vary significantly

#### Technology specific characteristics

- Construction costs, operational lifetimes, capacity factors

#### Project structure

- Percentage share of equity vs. debt.
- Percentage share of project value that needs to be hedged.

Based on the requested amount of USD 250 million for a pilot, the instrument could provide a total hedging capacity of USD 915 million to projects. This can support USD 1.45 billion of wind and solar PV projects with potential GHG reductions of 1.7 MtCO<sub>2</sub>/yr and a cumulative total of 39.3 MtCO<sub>2</sub> over the operational lifetime of the assets. These results are for the given deployment scenario and could vary significantly in practice.



## Model Scenario - Portfolio impacts of the Long-Term FX Risk Management Instrument

| Assumptions   |              |            |            |
|---|--------------|------------|------------|
|   | Wind onshore | Solar PV   | Total      |
| Portfolio share of projects                         | 65.00%       | 35.00%     |            |
| Installed cost \$MM/ MW                             | \$1.40       | \$1.60     |            |
| Equity split  | 30%          | 30%        |            |
| Debt split  | 70%          | 70%        |            |
| Debt share hedged                                   | 90%          | 90%        |            |
| Capacity factor                                     | 37%          | 20%        |            |
| Operational lifetime (yrs)                          | 20           | 33         |            |
| Leverage IFC (best case)                            |              |            | 8.0        |
| Leverage IFC (worst case)                           |              |            | 5.0        |
| Leverage IRX (best case)                            |              |            | 4.8        |
| Leverage IRX (worst case)                           |              |            | 2.6        |
| Donor capital \$MM (IFC)                            |              |            | \$50       |
| Donor capital \$MM (IRX)                            |              |            | \$200      |
| Grid emission factor (tCO <sub>2</sub> /MWh)        |              |            | 0.633      |
| Results   |              |            |            |
| Portfolio   | Wind onshore | Solar PV   | Total      |
| Likely* capacity IFC Facility (\$MM)                |              |            | \$325      |
| Likely* capacity IRX (\$MM)                         |              |            | \$740      |
| Joint transactions (\$MM)                           |              |            | \$150      |
| Total capacity of facilities (\$MM)                 |              |            | \$915      |
| Hedging capacity provided (\$MM)                    | \$595        | \$320      | \$915      |
| Capacity installed (MW)                             | 674          | 318        | 992        |
| Total value of projects (\$MM)                      | \$944        | \$508      | \$1,452    |
| Cumulative electricity generation (MWh)             | 43,712,102   | 18,368,625 | 62,080,727 |
| Electricity generated per year (MWh)                | 2,185,605    | 556,625    | 2,742,230  |
| Cumulative emissions reductions (tCO <sub>2</sub> ) | 27,669,761   | 11,627,340 | 39,297,100 |
| Emissions reductions per year (tCO <sub>2</sub> )   | 1,383,488    | 352,344    | 1,735,832  |

\* Likely is defined as the median leverage estimate

## REFERENCES

BNEF. (2015). Asset Finance Database. Retrieved from <https://www.bnef.com/AssetFinancing/>

Donnelly, D. (2015). Financing renewables projects in Africa. In *Clean Energy Finance Guide*. VB/Research Ltd.

EU. (2011). Recommendation of the European Systemic Risk Board of 21 September 2011 on Lending in Foreign Currencies (ESRB/2011/1). *Official Journal of the European Union*, (2011/C 34.

Gray, R. D., & Schuster, J. (1998). The East Asian Financial Crisis—Fallout for Private Power Projects. *Public Policy for the Power Sector*, 146 (The World Bank Group).

MFX. (2015). *Understanding Cross Currency Swaps: A Guide for Microfinance Practitioners*.

NREL. (2015). OpenEI Transparent Cost Database. Retrieved from <http://en.openei.org/apps/TCDB/>

Van Swaay, P. (2013). A Powerful Case for Local Currency. *Africa Energy Year*