



Astris Finance

TCX

Climate
INITIATIVE
Bonds

FINANCING CONSIDERATIONS FOR RENEWABLE ENERGY PROJECTS IN ILLIQUID MARKETS IN ASIA

Presentation to the British Chamber of Commerce of Myanmar | Webinar of October 14th, 2020

I. COMPANY OVERVIEW



20 Years of Experience in Infra & Energy Finance

Global Transaction Advisory
Infrastructure & Renewable Energy

20
years

We were established 20 years ago as the LatAm advisory arm of a leading European banking group specialized in public and project finance. We became independent through an MBO in 2008. We have grown global since then.

40 bn

We have advised on over 250 transactions and USD 40 bn+ of investment in the **Infrastructure & Energy (I&E)** space, across virtually all markets globally. We advise some of the largest, most sophisticated I&E developers and investors.

6,000
MW

We have advised on more than 100 renewable energy transactions globally, from Japan, to South East Asia, India, Western Europe, South Africa, North America and Latin America – representing over 6,000 MW across all major technologies.

#1

We have been elected **Financial Advisor of the Year for Latin America by IJ Global** for three out of the past four years (2016, 2018 and 2019). In 2017, we ranked *#5 in the IJ Global League Tables for Global Renewables financial advisory, #1 for European Renewables and #2 for LatAm Renewables in 2019*

50
Team
Members

We are one of the largest independent advisory teams in the I&E space globally. Our team is made of c. 50 bankers, including 10 senior managers with a combined experience in excess of 200 years in the sector

180+
Investors

We have fluid access to over 180 investors specialized in energy and infrastructure globally. We can help mobilize liquidity across the capital structure at a competitive risk-adjusted cost.





Astris Finance

Recent Awards



- *IJ Global - Financial Advisor of the Year for the Americas (March 2016)*
- *IJ Global - Financial Advisor of the Year for the Latin America (March 2019)*
- *IJ Global Americas Multi-Source Financing Deal of the Year (2015)*
- *PFI Americas P3 Deal of the Year (2015)*
- *TXF Export Credit Deal of the Year (2015)*
- *IFLR Americas: Project Finance Deal of the Year (2016)*

Landmark Closings in Latin America, Europe and South East Asia



Latin America - 2018



- Cerro Dominador USD 1 bn senior + mezz debt package
- Largest solar project ever in Lat Am
- Dual PV / CSP technology
- Complex electricity market
- Sponsor: Tier 1 PE Fund



Europe - 2018



- Sale of independent RNW IPP Langa to ENGIE
- 300+ MW of operating assets
- 500 MW of pipeline with PPA's
- Final leg of a five-year development structured by Astris



SE Asia - 2019



- Financial close for a 49.5MW solar farm in central Vietnam
- Second project finance deal in Vietnam for foreign-owned solar project
- Financing pushed limits of local banking market

II. THE STUDY



Objective and Methodology of the Study

- General trend in the direction of “**de-dollarization**” of **power purchase agreements** for renewables in SEA
- This trend creates a **liquidity issue** for developers of projects due to: (i) cross-currency mismatch that result from cross-border financing and/or (ii) constraints in domestic financing capacity
- **Main objective:** structuring innovative local currency-hedged financing solutions to finance local currency denominated PPAs in
 - illiquid markets like **Myanmar, Sri Lanka, Nepal**
 - liquidity-constraint markets like **Vietnam and Indonesia**

Methodology

- **Understand** in each renewables market:
 - PPA - Tariff structure (fixed, dual-currency, indexation, etc.)
 - Availability of local and/or international financing sources (senior debt, bonds,...)
 - Available credit enhancement solutions improving terms of the debt financing (government support, PRI, First Loss Guarantee,...)
- **Structure and price** offshore LCY financing structures (e.g. “Synthetic” LCY Loan) and possibly onshore LCY funding
- **Benchmark** LCY financing solutions against USD financing

Attractiveness of LCY PPAs is function of:

1

Tariff Structure

2

Cost of debt
(FX hedging | Risk Insurance)

3

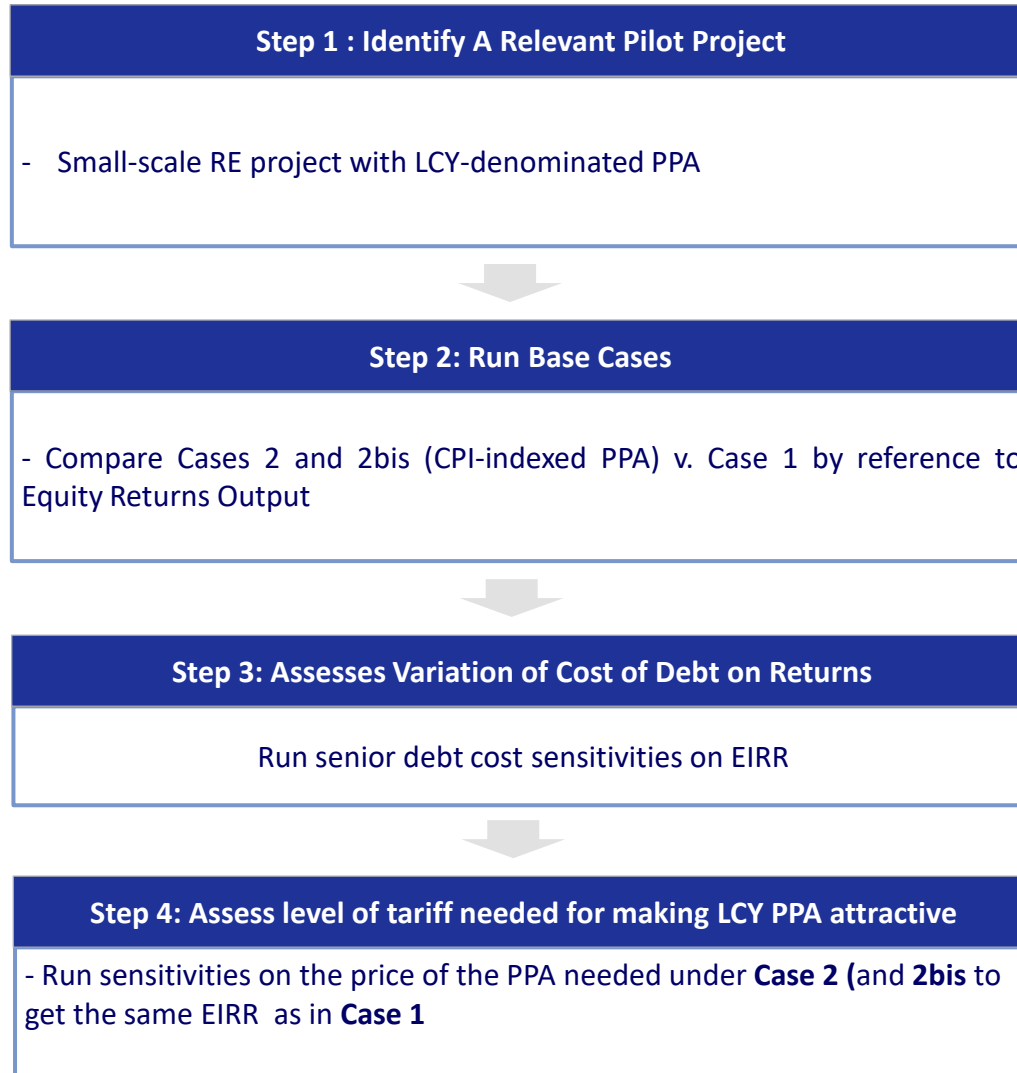
Equity returns
 (“EIRR”)

Defined Cases & Capital Structures

- Capital structure may vary for each market depending on the following parameters: (i) Tariff structure (ii) Cost of Debt and Equity Returns

Case	PPA Currency	Capital Structure of the RE Project	Comments
1 – Benchmark	USD	<ul style="list-style-type: none"> 30% equity 50% USD loan 20% USD green bond 	<ul style="list-style-type: none"> Naturally hedged / optimized USD-denominated structure against which LCY financing solution will be benchmarked
2 – LCY Structure #1	Partial LCY Partial USD <u>(No indexation)</u>	<ul style="list-style-type: none"> 30% equity [•]% Synthetic LCY loan [•]% LCY debt [•]% USD [or domestic] green bond 	<ul style="list-style-type: none"> Synthetic hedging solution (“Cross Currency Swap”) “from the back” to mobilize USD debt to finance LCY PPA CCS enables to de-risk FX exposure almost as a natural hedge Adding a LCY tranche is to be considered when relevant to finance domestic costs
2bis – LCY Structure #2	Partial LCY Partial USD <u>Indexed to inflation</u>	<ul style="list-style-type: none"> 30% equity [•]% Synthetic LCY loan [•]% LCY debt [•]% USD green bond 	<ul style="list-style-type: none"> Same financing structure as case 2 Assess improvement on equity returns given inflation indexation making the LCY financing solution more “affordable”

Market Analysis in Four Steps



Sample Sensitivity Output

Sensitiveness of Equity IRRs to Cost of Cross Currency SWAP

	EIRR per Synthetic LCY tranche rate												
	-3%	-2.5%	-2%	-1.5%	-1%	-0.5%	-	0.5%	1%	1.5%	2%	2.5%	3%
Case 2	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%
Case 2bis	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%	[•]%

Sensitiveness of Equity IRRs to Cost of Green Bond Coupon










	EIRR per Green Bond Coupon				
	-2	-1%	-	+1%	+2%
Case 2	[•]%	[•]%	[•]%	[•]%	[•]%
Case 2bis	[•]%	[•]%	[•]%	[•]%	[•]%

Required Initial PPA Prices to Achieve Target EIRR Under Each Structure

	Required Initial PPA Price for achieving target EIRR
	15%
Case 1	96
Case 2	155
Case 2bis	96

	Impact of 1% Change in target EIRR on PPA price (USD/MWh)
Case 1	+/- 5
Case 2	+/- 6
Case 2bis	+/- 4

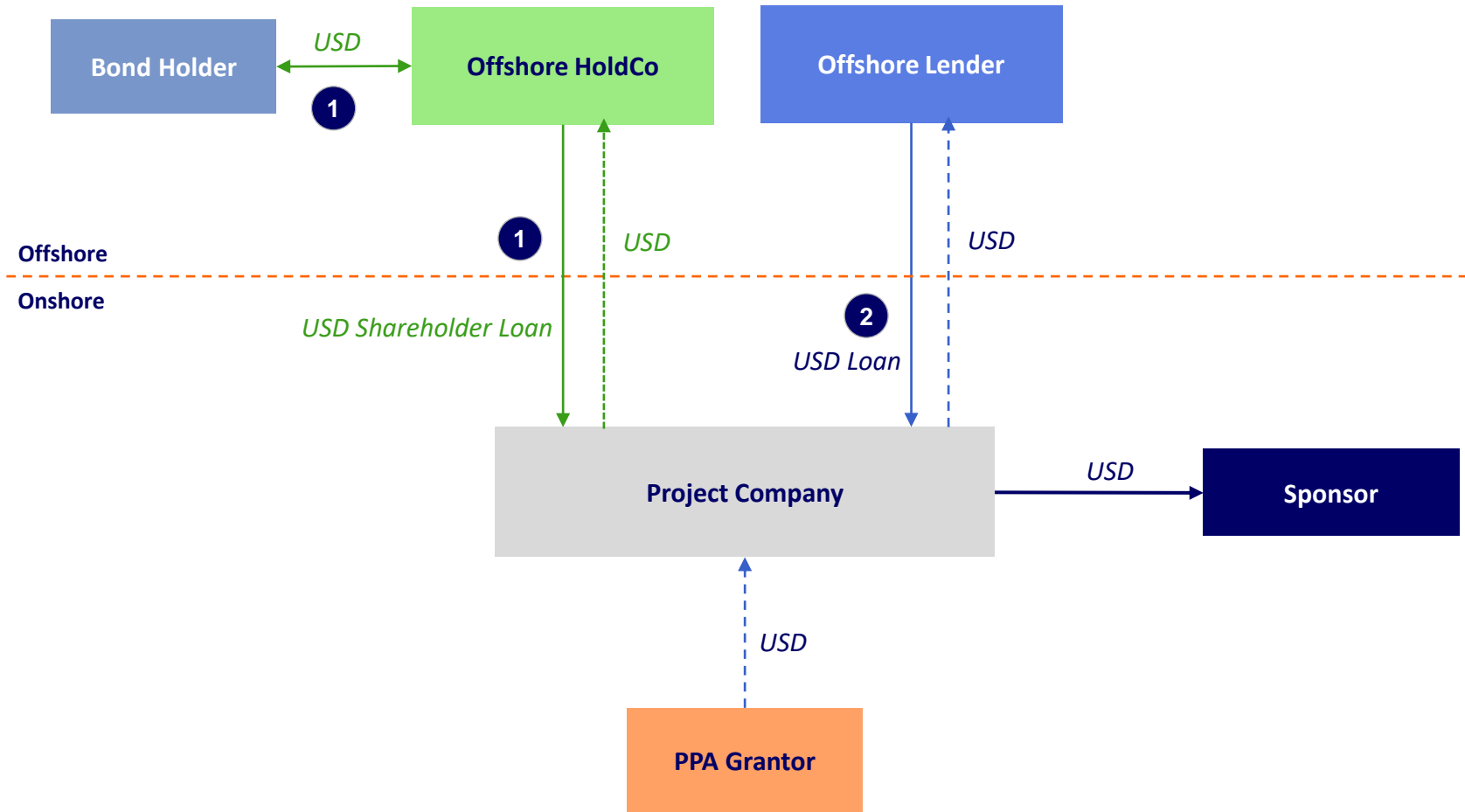
Step 1: Selection of A Pilot Project For Each Market

Country	Currency	Target PPA Tariff Structure	PPA Duration	Assumed PPA Price (USD/MWh)	Pilot project	Capacity
Myanmar 	Kyat (MMK)	Hybrid (USD/Kyat)	25 years	Eq. [90-95]	Utility-scale Solar 	50 MW
Sri Lanka 	Sri Lankan Rupee (LKR)	LKR ¹	20 years	Y1-Y7: eq. c.117 Y8-Y20: eq c 83	Portfolio of Rooftop Solar projects 	Up to 50 MW
Nepal 	Nepalese Rupee (NPR)	[]% subject to financing structure	30 years	Dry season: eq. 70 Wet season: eq. 41	Hydro 	50 MW
Indonesia 	Indonesian Rupee (IDR)	IDR (<10MW)	20 years	Eq. c. 100	Portfolio of small-scale Biogas projects 	15 MW
Vietnam 	Vietnam Dong (VND)	VND	To be negotiated	85 ²	Portfolio of Rooftop Solar projects (self-consumption) 	15 MW

Note:

- 1) USD denomination is authorized in the current regulatory environment
- 2) FiT for output injected to the grid. Self-consumption tariff is to be negotiated

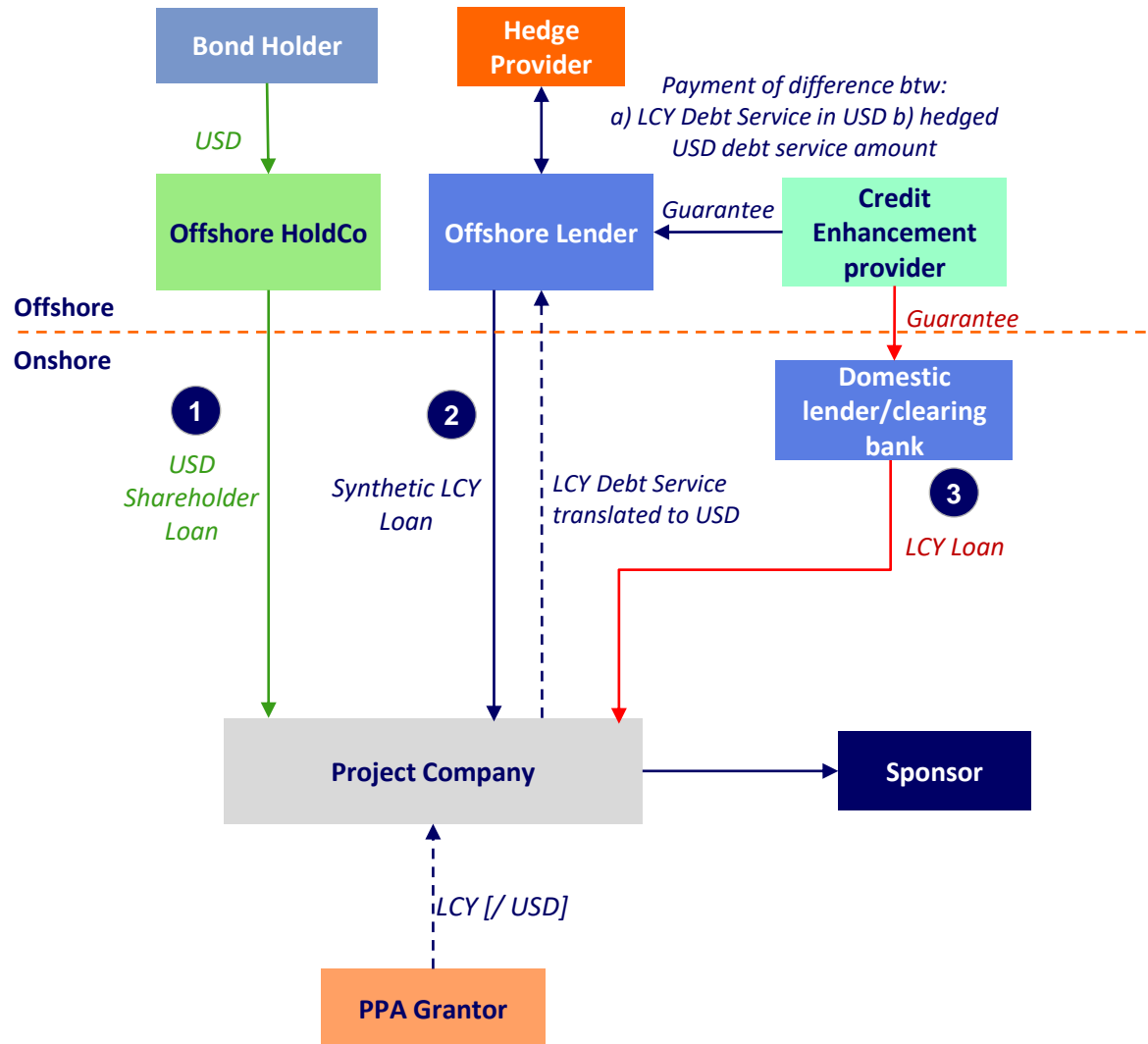
Benchmark Case 1: USD-Denominated PPA – USD debt financing



Financing Considerations for RE Projects in Illiquid Markets

Case 2 and 2 bis: LCY-Denominated PPA with or w/o CPI Indexation (“Synthetic LCY Loan”)

- Case 2:** Partial USD and partial LCY PPA not indexed to CPI inflation plus the following senior debt structure:
 - [•]% in USD Green Bond (at the end of the construction period)
 - [•]% Synthetic LCY Tranche
 - [•]% in LCY Tranche and
- Case 2bis:** Same as Case 2 assuming indexation to inflation for the LCY PPA component



III. STUDY RESULTS – MYANMAR CASE



Case Study : Myanmar and MMK

Myanmar Currency Market and Project Financing

Currency market

- Since April 2012, the Central Bank of Myanmar has operated the daily two-way auctions of foreign exchange aimed at smoothing exchange rate fluctuations
- Myanmar's MMK has depreciated remarkably since July 2018 due to a combination of external effects:
 - Stronger USD in international markets thanks to booming US economy and high dependency of Myanmar on USD,
 - Myanmar's rising trade deficit, and
 - Limited investment opportunities in the country.
- Foreign-exchange reserves of Myanmar increased from USD 4.6bn in July 2015 to USD 5.8 bn in June 2020 growing at an average annual rate of 0.43%

Offshore financing is necessary given absence of domestic long-term financing

- There is no long-term bond market. The longest tenor for a government bond is 5Y and commercial banks do not issue bond
- Maximum 3-year tenor for commercial bank loans
- Thin local bank balance sheet
- Cap on interest rates: 10% for guarantee-backed loans and 14.5% for non-secured loan – any derogation would require CBM's approval → local bank cannot price investment risks

Key Country Data

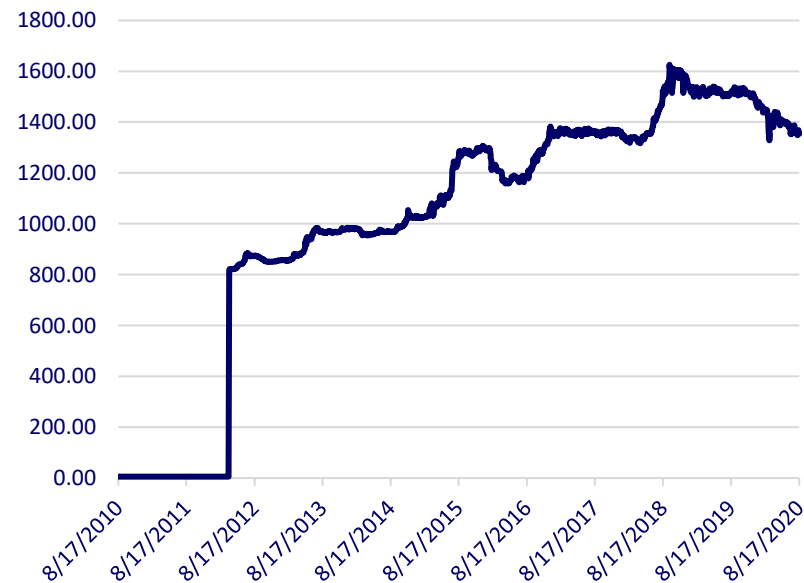
Macroeconomic Data

Credit Rating	N/A
Country Risk	9.56%
5y Sovereign Benchmark	8.46%

Currency Data

Currency	Myanmar Kyat – MMK
8y Av. Change in MMK/USD	6.21%
Inflation 2019	6.00%
Mid term Inflation Expectations	6.27%
Mid term Inflation Expectation US	2.24%

MMK/USD Evolution (2010-2020)



Case Study : Myanmar and MMK

Pilot Project Assumptions – 50 MW utility scale Solar project

- Myanmar has launched its first solar tender in mid 2020 under a **Myanmar Kyat (MMK) - denominated PPA though the authorities express strong preference for “de-dollarized” PPA**
- We have chosen a 50 MW utility scale solar project for our assessment to reflect the relevance to the current state of the market and the need for USD financing of RE projects
- Key project assumptions:

Technical		Financing	
Plant Capacity	50 MW	Maximum Leverage	70%
Annual production	76,240 MWh	Interest rates	Synthetic LCY: 20.5% USD: 7.0%
PPA		Tenor	Synthetic LCY: 10-y ² USD: 7-y
Price	96 USD/kWh	Macroeconomics	
USD Indexation	20-25% ¹	Tax rate	25% with 5-year exemption period
Duration	25 years	Annual inflation expectation ³	6.3%
Investment		Annual MMK/USD depreciation ⁴	4%
Investment per MW	USD 1.0 m		
OpEx per MW	USD 0.5 m		

¹USD indexation subject to final capital structure and USD green bond tranche size

²10-year mini perm sized on a 14 year amortization profile.

³Inflation expectations in Myanmar are based in the World Economic Outlook from the IMF

⁴Equal to the differential in Myanmar and US inflation expectations on the long run based in the World Economic Outlook from the IMF



Case Study : Myanmar and MMK

Base Case Results and Initial EIRR Comparison per Structure

- We have used our proprietary financial model and the set of assumptions under the Pilot Project for RE projects to illustrate the three base cases for a 50 MW solar PV plant in Myanmar. Initial results on EIRR below
 - To note that the resulting EIRR on Case 1 matches the required return for an investor in a solar plant in Myanmar calibrated under the CAPM model

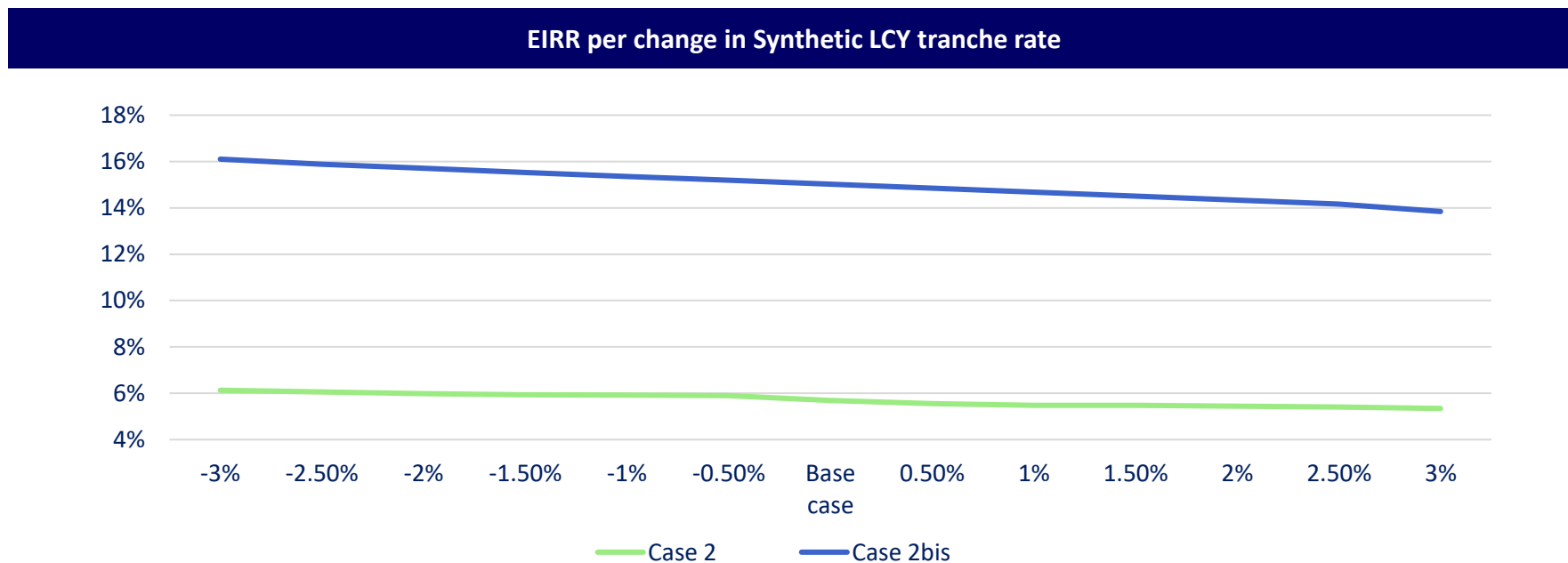
Base Cases Assumptions and Results										
Input									Output	
	PPA Denomination	Indexation to Inflation?	Capital Structure	PPA Price (\$/MW)	Interest Rate	Tenor	Blended Int. Rate ²	Project IRR	Equity IRR	Min DSCR
Case 1	USD	No	<ul style="list-style-type: none"> USD Bond: 70% Equity: 30% 	96	USD: 7.0%	• USD: 7-y	7.0%	12.0%	15.4%	1.42 x
Case 2	Hybrid USD/MKK	No	<ul style="list-style-type: none"> USD Bond: 20% Synthetic LCY: 19% Equity: 61% 	96	<ul style="list-style-type: none"> USD: 7.0% Synthetic LCY: 20.05% 	<ul style="list-style-type: none"> USD: 7-y Synthetic LCY: 10-y¹ 	13.8%	7.9%	5.7%	1.30x
Case 2bis	Hybrid USD/MKK	Yes for MKK	<ul style="list-style-type: none"> USD Bond: 20% Synthetic LCY: 36% Equity: 44% 	96	<ul style="list-style-type: none"> USD: 7% Synthetic LCY: 20.05% 	<ul style="list-style-type: none"> USD: 7-y Synthetic LCY: 10-y¹ 	15.7%	16.0%	15.2%	1.30x

- Case 2: High average cost of debt destroys shareholder value at current project IRR and limits debt leverage to c. 40%
- Case 2bis: inflation indexation tariff mechanism makes the LCY financing solution more “affordable” assuming the government will accept to hedge the project against macroeconomic risks

Case Study : Myanmar and MMK

Sensitiveness of Equity IRRs to the Synthetic LCY Tranche Rate

EIRR per Synthetic LCY tranche rate													
	-3%	-2.5%	-2%	-1.5%	-1%	-0.5%	-	0.5%	1%	1.5%	2%	2.5%	3%
Case 2	6.13%	6.05%	5.98%	5.93%	5.92%	5.90%	5.69%	5.55%	5.48%	5.48%	5.44%	5.41%	5.34%
Case 2bis	16.11%	15.88%	15.71%	15.53%	15.36%	15.19%	15.02%	14.85%	14.68%	14.51%	14.34%	14.17%	13.84%



- We have observed the effect of the **variation** of the cross-currency SWAP rate over equity returns in both cases 2 and 2bis
- Summarizing the results:
 - Average change in EIRR per 50bps change of CCS cost is 4bps for Case 2 and 19bps for Case 2bis
 - Case 2bis is more sensitive to the CCS rate in comparison to Case 2 due to the larger Synthetic LCY Tranche in Case 2bis

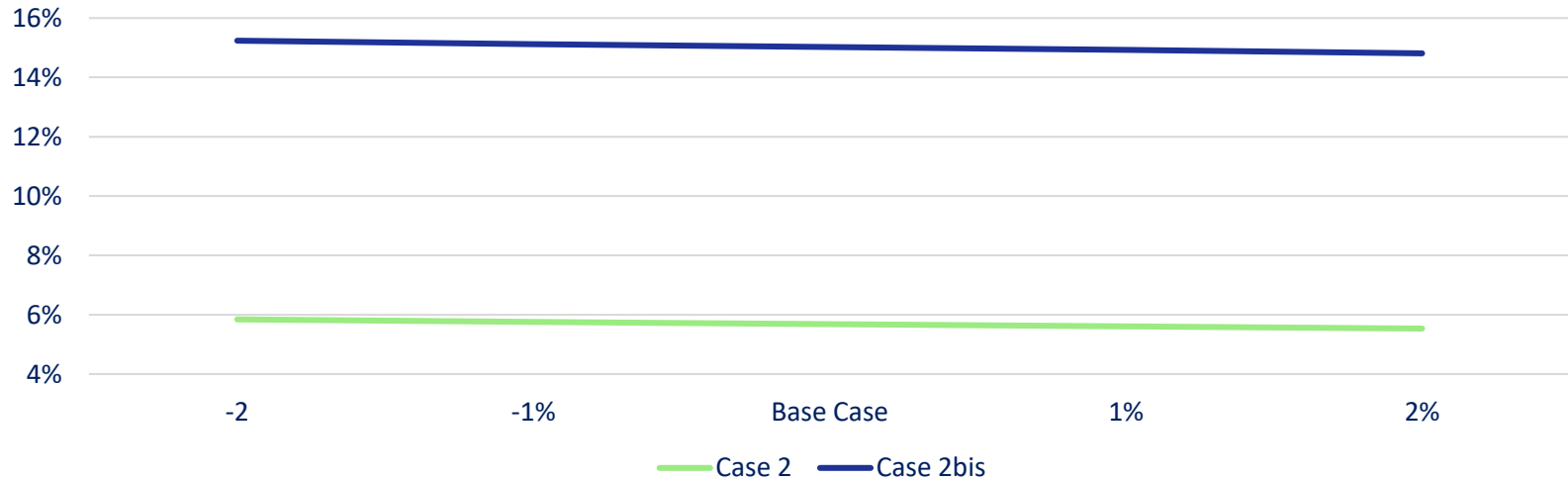


Case Study : Myanmar and MMK

Sensitiveness of Equity IRRs to Green Bond Coupon

EIRR per Green Bond Coupon					
	-2	-1%	-	+1%	+2%
Case 2	5.84%	5.76%	5.69%	5.61%	5.53%
Case 2bis	15.23%	15.12%	15.02%	14.92%	14.81%

EIRR per change in USD Green Bond Coupon



- We have observed the effect of the bond coupon rate over equity returns in both cases 2 and 2 bis
- Summarizing the results:
 - Average change in EIRR per 100bps of the green bond coupon rate is the same of 8bps for both Case 2 and Case 2bis

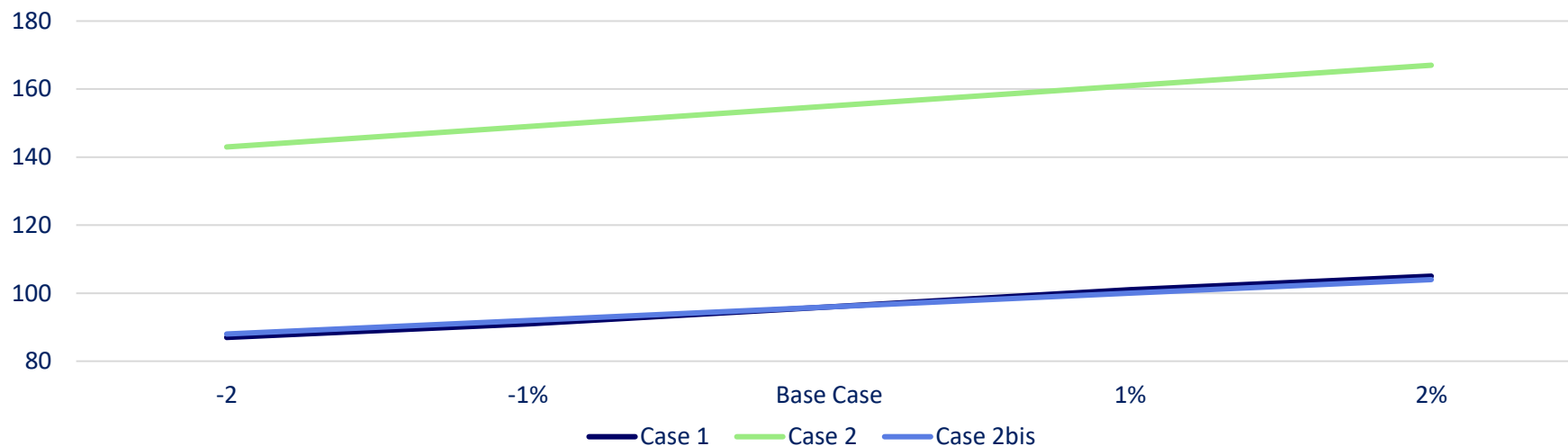
Case Study : Myanmar and MMK

Required Initial PPA Prices to Achieve Target EIRR Under Each Structure

Required Initial PPA Price for achieving target EIRR	
	15%
Case 1	96
Case 2	155
Case 2bis	96

Impact of 1% Change in target EIRR on PPA price (USD/MWh)	
Case 1	+/- 5
Case 2	+/- 6
Case 2bis	+/- 4

PPA Prices to achieve target EIRR



- To assess level of tariff needed for making the LCY PPA attractive, the PPA price for Cases 2 and 2bis that results in the same EIRR than in Case 1 [15%] is calculated
- Case 2 requires PPA price to increase by 59 USD/MWh to reach the target EIRR of 15%

Thank you!



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