

Forest Carbon Partnership Facility

Portfolio Management Update

21st meeting of the Carbon Fund (CF21)
Paris, France
January 22-23, 2020



Outline of Presentation

- Decision at this meeting
- Funding
 - Financial contributions and funds available for purchase of ERs
 - LOI/ERPA commitments
- Portfolio Management
 - Carbon Fund portfolio summary
 - Update on signed ERPAs
 - Status of ERPA negotiations & expected timeline for ERPA signatures
 - Monte Carlo simulation
 - ER delivery risk assessment model
 - Summary of different portfolio management models
 - HFLD Adjustments in the portfolio

Decision at CF21

Decide on the deadline for ERPA signature

- There are 14 ER programs in the Carbon Fund (CF) portfolio that are yet to sign ERPAs
- Options for setting the deadline for ERPA signature
 - Option 1: June 30, 2020 for all ER Programs
 - Option 2: June 30, 2020 or 12 months from unconditional selection into the CF portfolio, whichever is later
 - Option 3: December 31, 2020 for all ER Programs
- Option 2 allows the 5 programs selected into the portfolio in July 2019 (some of them provisionally) a bit more time, as shown on the next slide
- If ERPAs are not signed by deadline, program will be cancelled, unless decided otherwise by CFPs

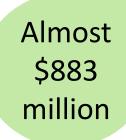
Date of selection into CF portfolio since CF20

Country	Selection into CF portfolio
Fiji	July 11, 2019
Nicaragua	August 21, 2019
Dominican Republic	November 12, 2019
Guatemala	November 12, 2019
Peru	November 19, 2019

FCPF Carbon Fund Contributions to Date

Donor Contributions as of December 31, 2019 (in \$ thousands)														
Participant Name	Total	Outstanding*	FY20	FY19	FY18	FY17	FY16	FY15	FY14	FY13	FY12	FY11	FY10	FY09
Australia	18,393										5,658	12,735		
BP Technology Ventures	5,000)										5,000		
Canada	5,015	i									5,015			
European Commission	6,710)											363	6,347
France	5,114							114				5,000		
Germany	321,295	i	55,974	57,265	29,616	54,771	13,329	32,108	27,280	6,556	15,443	21,125	3,819	4,009
Norway	297,088	1	27,166	27,618	12,640		58,352			161,311				10,000
Switzerland	10,796	i									10,796			
The Nature Conservancy	5,000)												5,000
United Kingdom	189,670	171,730										17,940		
United States of America	18,500)				4,500				4,000		10,000		
Committed Funding	882,580	171,730	83,140	84,883	42,256	59,271	71,681	32,222	27,280	171,867	36,912	71,800	4,182	25,356

^{*}Amounts may vary due to exchange rate fluctuations



Carbon Fund Financial Situation: Sources and Uses Summary

Carbon Fund Sources and Uses Summary (\$m)

All 18	Possible scenario
882.6	882.6
18	18
18	16
22.7	22.7
44.0	41.5
66.7	64.2
815.9	818.4
163	164
45	51
	882.6 18 18 22.7 44.0 66.7 815.9 163

LOI & ERPA Commitments

Country	Max LOI volume	ERPA contract volume/ expected volume	HFLD	HFLD proportion				
Chile*	5.2	5.2						
Costa Rica	12.0	12.0						
Cote D'Ivoire	16.5	16.5						
DR Congo*	10.0	11.0	11					
Dominican Republic	7.5	5.0						
Fiji	3.6	3.6						
Ghana*	18.5	10.0						
Guatemala	10.5	10.5						
Indonesia	22.0	30.0						
Lao PDR	8.4	11.0						
Madagascar	16.4	10.0						
Mexico	8.7	8.7						
Mozambique*	8.7	10.0						
Nepal	14.0	9.0						
Nicaragua	11.0	11.0						
Peru	6.4	6.4	No					
Republic of Congo	11.7	11.7	11.7					
Vietnam	10.3	10.3						
TOTAL	201.4	191.9	22.7	12%				

- Committed funding = \$882.6 million
- Committed through contract volumes in signed ERPAs of 36.2 m tons = \$181 million

^{*} Signed ERPAs

Available for purchase of ERs

Carbon Fund Sources and Uses Summary (\$m)

		Possible
	All 18	scenario
Sources (\$m)	882.6	882.6
Number of ER Programs expected	18	16
Number of ER Programs Expected	18	16
Available for Purchase of ERs	815.9	818.4
Signed ERPAs (4)	181.0	181.0
Sub-total	634.9	637.4
Agreed Term Sheets (2)	111.5	111.5
Sub-total	523.4	525.9
Term Sheets close to agreement (4)	177.5	177.5
Sub-total	345.9	348.4
Term Sheets yet to be agreed (4)	298.5	298.5
Sub-total	47.4	49.9
LOIs for countries yet to send Term Sheets	191.0	50.0
Total Available	-143.6	-0.1

Carbon Fund Portfolio Summary

- Carbon Fund term ends 31 December 2025
- 18 countries have submitted Program Documents (ERPDs) and have been selected unconditionally into the Carbon Fund portfolio
- 4 ERPAs have been signed:
 - DRC ERPA signed September 2018 (committed \$55 million)
 - Mozambique ERPA signed January 2019 (committed \$50 million)
 - Ghana ERPA signed June 2019 (committed \$50 million)
 - Chile ERPA signed December 2019 (committed \$26 million)
- Total committed \$181 million, plus call options in all 4 signed ERPAs
- ERPA workshops held and default ERPA term sheet shared with all 14 remaining programs in the Carbon Fund portfolio
- Exchange of ERPA commercial terms in progress with 10 countries Costa Rica,
 Dominican Republic, Guatemala, Indonesia, Lao PDR, Mexico, Madagascar, Nepal,
 Nicaragua, and Vietnam

Update on signed ERPAs

DRC

- ERPA effectiveness period is being extended as five of six conditions of effectiveness (COEs) are yet to be met.
 - Extension of 6 months to March 21, 2020 to meet all remaining COEs other than BSP
 - Extension of 12 months to September 21, 2020 to submit final BSP
- Much of the focus in the past year has been on revising the reference level and working on finalization of the BSP
- Final BSP submission is largely dependent on the revised reference level

Mozambique

- Mozambique has submitted the documentation required to meet the two COEs under its ERPAs.
- Final BSP is under review by FMT and will be shared with CFPs. ERPA effectiveness period is being extended as COE on BSP will be considered as fulfilled only after FMT review and feedback from CFPs is completed.
- Mozambique is requesting inclusion of ERs generated prior to ERPA signature & initial safeguards assessment related to such ERs has been completed.
- Monitoring report for the first verification is expected in early 2020

Update on signed ERPAs (contd.)

Ghana

- Work in progress to meet the remaining two of three COEs by the effectiveness deadline on June 11, 2020
- Improvements to the accuracy of the activity data on deforestation, forest degradation and enhancement of forest carbon stocks in the reference period (2004-2014) is also ongoing.

Chile

Work ongoing to submit documentation required to meet the three COEs

Status of ERPA negotiations

ERPA Commercial Terms

- Exchange of expectations on ERPA commercial terms are at an advanced stage for Vietnam, Costa Rica, Guatemala, Nepal, Nicaragua and Dominican Republic
- FMT has received initial expectations on ERPA commercial terms from Indonesia, Lao PDR, Madagascar, Mexico
- FMT yet to receive initial expectations on ERPA commercial terms from Cote d'Ivoire, Fiji, Peru, and Republic of Congo

Benefit Sharing Plans

- Vietnam's Advanced Draft BSP available on FCPF website
- World Bank review of BSPs in progress for Costa Rica, Dominican Republic, Fiji, Guatemala, Indonesia, Lao PDR, Madagascar, Mexico, Nepal, and Nicaragua

ER Title Transfer

• Preparation of documentation to demonstrate ability to transfer ER title in progress for all 14 Programs.

Expected timeline for ERPA signatures

Timeline	Countries	Number
Already signed	DRC, Mozambique, Ghana, Chile	4
By March 2020	Vietnam, Nepal, Costa Rica	3
By June 2020	Dominican Republic, Guatemala, Nicaragua, Lao PDR, Madagascar, Indonesia, Fiji, Cote d'Ivoire, Mexico, Peru	10
After June 2020	Republic of Congo	1
Total		18



FCPF Carbon Fund

Monte Carlo simulation



Monte Carlo Simulation

- Performs risk analysis by building models of possible results by substituting a range of values—a probability distribution—for any factor that has inherent uncertainty
- Then calculates results over and over, each time using a different set of random values from the probability functions
- As the portfolio develops the FMT is using increasingly accurate values and narrower ranges of uncertainty

Today's Programs:

Estimated Reference Levels and Program Effectiveness

	Unit: [million tCO2e/year]	HFLD Adjustment	Emissions ²	Removals ²	Effectiveness
		(% of total emissions)			(% estimate, indicative)
	Chile		12.6	-12.4	7%
	Congo, Dem Rep	5.6 (13%)	43.5	-1.4	18%
	Congo Rep	5.4 (72%)	7.5	0.0	31%
	Costa Rica		9.3	-5.2	12%
	Cote d'Ivoire		9.7	-0.1	58%
	Dominican Rep		3.8	-3.1	18%
	Fiji		1.6	0.0	43%
	Ghana		45.2	-0.1	6%
Final ER-PD	Guatemala		15.3	-2.2	20%
1	Indonesia		68.4	0.0	25%
	Lao PDR		10.5	-2.0	26%
	Madagascar		11.5	-0.1	33%
	Mexico		24.0	0.0	25%
	Mozambique		6.5	0.0	62%
	Nepal		1.6	-0.7	84%
	Nicaragua		16.6	-1.0	16%
	Peru		33.8	0.0	16%
	Vietnam		10.9	-6.3	25%
	Total	12.9 (4%)	332.3	-34.6	

¹ January 2020

² For respective reference period

Key variables that affect the eventual ER Volume in the Carbon Fund portfolio

- 1. Updates to Reference Level (RL) estimates
 - RL is more carefully estimated for the ER-PD and sometimes later (e.g., using updated emission factors or different satellite data)
- 2. Program Effectiveness (percentage change in rate of emissions or removals during program implementation)
 - ER-PDs have more details on implementation design and hence effectiveness
- 3. Quality of Measurement (statistical uncertainty associated with measured emission reductions)
 - Improved measurement (e.g., better data) lowers uncertainty
 - Uncertainty (confidence in estimates) used for conservativeness factors (ER discount)
- 4. Share of Total ERs offered to the Carbon Fund
 - Countries may choose to retain a certain portion of ERs for sale to other buyers or may not be able to transfer title





Key variables that affect the eventual ER Volume in the Carbon Fund portfolio (cont.)

- 4. Risk of Reversals (disturbance events lead to emissions that impact ERs paid for by the Carbon Fund)
 - Risk is assessed during verification
 - Risk of reversal can be mitigated (through program design) and managed (a reversal buffer)
 - A portion of ERs (10-40%) is set-aside in a Reversal Buffer account (and only released if reversal risk is reduced)
- 5. Length of the ERPA Term
 - Carbon Fund until 2025
- 6. Pipeline attrition







Carbon Accounting Calculation of Emission Reductions (ERs)

Total ER Volume

Uncertainty set aside

ERs available for sale to other buyers

Reversal Buffer

ERs paid for by CF

- Subtract the reported and verified emissions and removals from RL
- Set aside a number of ERs to reflect the level of uncertainty associated with the estimation of ERs (percentage of ER Volume)
- CF will buy percentage of the ER Volume
- If CF Buffer is used → set-aside of ERs in CF Buffer to deal with risk of Reversals of ERs purchased by the CF (percentage of ERs purchased by CF)
- Remaining ERs can be sold to other buyers

Monte Carlo-Based Portfolio Simulations



First, set variables ...

Portfolio Variable	Chile	Congo, Dem Rep of	Congo, Rep of	Costa Rica	Cote d'Ivoire	Dominican Republic	ij	Ghana	Guatemala	Indonesia	Lao, PDR of	Madagascar	Mexico	Mozambique	Nepal	Nicaragua	Peru	Vietnam
Change relative to RL	+/-5%																	
Program effectiveness	5-15%	10- 30%	20- 40%	10- 25%	25- 65%	10- 20%	10- 45%	5-20%	10- 20%	20- 40%	20- 30%	20- 40%	20- 30%	30- 70%	30- 90%	5-20%	5-20%	20- 30%
Uncertainty Buffer set-aside	8%	4%	8%	0%	4%	10%	4%	6%	15%	4%	11%	8%	0%	4%	12%	4%	0%	4%
Reversal Buffer set-aside	21%	23%	23%	20%	23%	15%	26%	20%	23%	26%	23%	28%	21%	30%	21%	22%	24%	21%
Share offered to Carbon Fund	79.7%	36.6%	90.0%	90.0%	90.0%	87.9%	90.0%	71.6%	90.0%	54.9%	83.6%	66.0%	26.3%	60.1%	90.0%	90.0%	23.9%	70.1%
ERPA Term	7.05	7.57	5.81	7.01	4.51	4.51	5.48	7.53	4.51	5.54	4.51	4.51	7.15	6.63	6.53	4.51	5.12	6.92
LOI drop rate	0%	0%	25%	5%	25%	25%	25%	0%	25%	25%	25%	25%	25%	0%	5%	25%	25%	5%

... and examine the outcome!

ER-PD Version	[million tCO ₂e]	Net emission reductions	ER V	olume in CF portf	folio	Buf	Buffer		
		< historical*	Average [*]	Max	Min	Uncertainty*	Reversal		
Oct-16	Chile	20.2	11.7	20.2	3.3	1.6	3.1		
Nov-16	Congo, Dem Rep of	68.1	29.9	42.9	17.9	4.4	8.9		
Dec-18	Congo, Rep of	13.1	25.6	28.9	22.2	3.6	7.6		
Oct-19	Costa Rica	17.9	11.9	18.4	4.9	0.0	3.0		
Apr-19	Cote d'Ivoire	20.3	12.2	18.0	5.7	0.8	3.6		
Aug-19	Dominican Republic	4.7	3.1	4.6	1.6	0.5	0.6		
Jun-19	Fiji	2.4	1.4	2.5	0.4	0.1	0.5		
Apr-17	Ghana	43.1	23.2	45.2	0.9	2.6	5.8		
Nov-19	Guatemala	11.8	6.3	9.6	2.6	1.8	1.9		
May-19	Indonesia	105.2	41.0	63.7	16.7	4.2	14.4		
May-18	Lao, PDR of	14.2	7.9	10.3	5.7	1.6	2.4		
May-18	Madagascar	15.8	6.9	9.9	4.0	1.3	2.7		
Nov-17	Mexico	43.9	9.1	12.2	5.9	0.0	2.4		
Apr-18	Mozambique	22.1	8.9	12.7	4.7	0.9	3.8		
May-18	Nepal	8.7	5.0	7.3	2.6	1.0	1.3		
Jul-19	Nicaragua	9.7	5.9	10.9	1.2	0.4	1.7		
Jun-19	Peru	22.4	4.1	7.6	0.5	0.0	1.3		
Jan-18	Vietnam	30.0	16.0	20.6	11.6	1.2	4.2		

Aggregate Simulated Portfolio at CF21

	Net emissions reductions	ER Volume	e in CF po	Buffer			
	< historical*	Average*	Max	Min	Uncertainty*	Reversal*	
[million tCO ₂ e]	473.5	230.1	345.3	112.4	25.9	69.2	



FCPF Carbon Fund

ER delivery risk assessment model



ER delivery risk assessment model

- Projects expected ER delivery for each program, considered in light of its ERPA purchase (or likely ERPA purchase)
- Can inform ERPA contracting, business planning and portfolio management
- Builds on the WB's Systematic Operations Risk-rating Tool (SORT) tool
- SORT risk categories are unpacked in order to consider the contributing factors in each category explicitly:
 - Makes it possible to compute probabilities
 - Allows issues that are contributing to high risk ratings to be systematically tracked and addressed

ER delivery risk assessment model - cont'd

- Development process relied on FMT/World Bank team of experts and included:
 - Identifying the major causes and sources of ER delivery, in alignment with SORT
 - Establishing interdependencies among the factors and their impact on the ER delivery through various causal chains
 - Quantifying those dependencies in terms of probability estimates elicited from team of experts
 - Testing, calibrating and validating the model
- Model can learn from data; over time, parameters could be adjusted based on evidence and lessons learned
- Model still relatively new; but should be useful for portfolio management in the future

ER delivery risk assessment model - cont'd

SORT risk categories and unpacked ER delivery risk assessment factors:

- 1. Political and governance
- 2. Macroeconomic
- 3. Sector strategies and policies:
 - Government ownership
 - Relevant sectoral policies, including those outside of the forest sector
 - Land tenure
- 4. Technical design of project or program:
 - Addresses the drivers of deforestation/degradation/land use change
 - Prioritizes proposed program activities from the available strategic options
 - Incorporates appropriate incentives tailored to different types of stakeholders
 - Proposed approaches are sufficiently diverse
 - Resources are flexible enough
 - Program costs have been appropriately identified
 - Proposed program activities have a track record of being effective
 - Program design reflects capacity of stakeholders involved in implementation

ER delivery risk assessment model - cont'd

SORT risk categories and unpacked ER delivery risk assessment factors:

- 5. Institutional capacity for implementation and sustainability:
 - Capacity of coordinating entity and stakeholders involved in implementation
 - Program complexity
 - Monitoring, reporting and verification (MRV)
 - Monitoring and evaluation
- 6. Fiduciary:
 - Secured financing
- 7. Environment and social
- 8. Stakeholders

Hypothetical scenarios

"High risk" program (#1 in table):

- Low-income country with poor political and macroeconomic stability
- Likely that environmental/anthropogenic events could affect program implementation
- Program design generally adequate, with a few challenging elements
- Despite a few favorable conditions, generally challenging environment for implementation, with capacity and financing being significant issues

2. "Medium risk" program (#2 in table):

- Middle-income country with good political and macroeconomic stability
- Unlikely that environmental/anthropogenic events could affect program implementation
- Strong program design, well tailored to country circumstances
- Good enabling environment for implementation, high capacity and adequate financing

Program Name			Risk-	Expected ERPA Delivery				
	Program ERs	Risk Factor (% delivery)	Adjusted	ERPA Contracted ERs	Expected ERPA Delivery	% ERPA Delivery		
Program #1 (high risk)	20,000	15%	3,000	6,000	3,000	50%		
Program #2 (medium risk)	14,400	35%	5,040	10,000	5,040	50%		
TOTAL	34,400		8,040	16,000	8,040	50%		

FCPF Carbon Fund preliminary ER delivery risk assessment

Preliminary estimates:

- Indicates net program ERs (after deduction of buffers) from current portfolio of 302 million (over \$1.5 billion @ \$5 per ton)
- Risk factor (% delivery) of between 20 and 57% across programs
- Results in a portfolio delivery of around 102 million risk-adjusted ERs over ERPA periods (\$510 million @ \$5 per ton)
 - o ER estimates based on:
 - Latest versions of ERPDs (Changes significant in some cases)
 - Contracted volumes expected to evolve from what was first established in Lols

FCPF Carbon Fund preliminary ER delivery risk assessment

- ER delivery risk assessment tool:
 - Generates a risk discount factor (%) based on a program's *specific* risk assessment at a certain point in time
 - Discount factor is applied to ER volume in ERPD (or best available estimate), after adjusting for the uncertainty and reversal buffer
 - Over time as ERPAs are signed and as program risk is assessed better, tool expected to provide most relevant ER delivery data
 - Reviewed risk assessments but still need to review tool prior to next
 CF meeting

Carbon Fund: Portfolio Management: Summary

- Still too early for firm predictions
- Available for purchase of ERs: approximately \$815.9 million
- Assuming \$5 per ton
- Monte Carlo: Average \$1.2 billion (230 million tons)
- ER delivery risk assessment model: around \$510 million (102 million tons)
- LOI values: 201.4 million tCO_2e @ \$5 per ton = \$1 billion (x 2/3rds = \$671 million)
- At this stage in developing the portfolio these numbers indicate that the delivery risks are difficult to assess and diversification across a number of programs is important
- Available monies are being allocated so will need to make decisions on contract volumes going forward

Portfolio Management: Historical Comparisons

	CF15	CF16	CF17	CF18	CF19	CF20	CF21
Available for purchase of ERs (\$m)	681	681	844	857	840	839	816
LOI maximum volume (m tons)	235	213	213	213	213	213	201.4
Monte Carlo 6 years/25% (m tons)	397	323	358	333	-	-	-
Monte Carlo 5 years/33% (m tons)	330	270	297	277	-	-	-
Monte Carlo (m tons) ERPA signature date					208	200	
Monte Carlo (m tons) portfolio selection date						240	
Monte Carlo (m tons)							230
Delivery Risk Assessment (m tons)	70-90	70-90	90	90	90	90	102

Carbon Fund: Portfolio Management: HFLD Adjustments

- 2 of the 18 programs in the portfolio are requesting HFLD adjustments (DRC and RoC – no longer Peru)
- DRC and RoC are only HFLD programs in portfolio
- What does Meth Framework say?

Portfolio Management: HFLD Adjustments What does the MF say?

- General Approach: Carbon Fund Participants seek both to achieve net emission reductions across the portfolio, and to pilot REDD+ across a diverse set of countries, including countries that have historically experienced low deforestation rates. Carbon Fund Participants have taken this into account when selecting Emission Reductions Programs (ER Programs) for signing an Emission Reduction Payment Agreement (ERPA).
- Criterion 13 (HFLD adjustment) (footnote): The Carbon Fund seeks both to achieve net emission reductions across its portfolio and to pilot REDD+ across a diverse set of countries, including those countries with high forest cover and low deforestation. Carbon Fund Participants have taken this into account when selecting ER Programs.

Carbon Fund: Portfolio Management: Some Basic Options

- Increase contract volumes for lower risk programs (lower contract volumes for high risk programs)
- Avoid large increases above LOI volumes for HFLD programs
- Use of call options improves future flexibility vis a vis high and low performing programs and HFLD programs

Summary of Decision Sought

- Decide on the deadline for ERPA signatures for remaining
 14 programs in the CF portfolio
 - Reiterate Options for setting the deadline for ERPA signature
 - Option 1: June 30, 2020 for all ER Programs
 - Option 2: June 30, 2020 or 12 months from unconditional selection into the CF portfolio, whichever is later
 - Option 3: December 31, 2020 for all ER Programs
- Decision will be recorded in Chair's Summary

THANK YOU!

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