



Forest Carbon Partnership Facility

Portfolio Management Update

Twenty Second Meeting of the Carbon Fund (CF22)

November 17, 2020

Outline of Presentation

- 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
 - Portfolio Management: Historical Comparisons

FCPF Carbon Fund Contributions to Date

Donor Contributions as of November 5, 2020 (in \$ thousands)

Participant Name	Total	Outstanding	FY21	FY20	FY19	FY18	FY17	FY16	FY15	FY14	FY13	FY12	FY11	FY10	FY09
Australia	18,392											5,658	12,735		
BP Technology Ventures	5,000												5,000		
Canada	5,015											5,015			
European Commission	6,709													362	6,347
France	5,114								114				5,000		
Germany	321,295			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	297,087			27,166	27,618	12,640		58,352			161,310				10,000
Switzerland	10,796											10,796			
The Nature Conservancy	5,000														5,000
United Kingdom	181,582		71,489	92,153									17,940		
United States of America	18,500						4,500				4,000		10,000		
Committed Funding	874,492	0	71,489	175,292	84,883	42,256	59,271	71,681	32,222	27,280	171,866	36,912	71,800	4,181	25,356

\$874.5
million

Carbon Fund Financial Situation: Sources and Uses Summary

Carbon Fund Sources and Uses Summary (\$m)		
Number of Programs	18	16
Sources (\$m)	874.5	874.5
Number of Lols (#)	18	18
Number of ER Programs expected	18	16
Uses		
Costs over Fund Lifetime		
Fixed Costs (FY10 to FY26)	24.9	24.9
ER Program Costs	58.0	55.7
Total Costs	82.9	80.6
Available for Purchase of ERs	791.6	793.9
Equiv to tons @ \$5 per ton (m)	158.3	158.8
Average ER Program	44.0	49.6

Available for purchase of ERs

Carbon Fund Sources and Uses Summary (\$m)		
<i>Number of Programs</i>	18	16
Sources (\$m)	874.5	874.5
Available for Purchase of ERs	791.6	793.9
Signed ERPAs (6)	282.5	282.5
<i>Sub-total</i>	509.1	511.4
Waiting for co-signature (1)	12.5	12.5
<i>Sub-total</i>	496.6	498.9
No objections received (3)	212.0	212.0
<i>Sub-total</i>	284.6	286.9
Agreed Term Sheets (6)	262.0	262.0
<i>Sub-total</i>	22.6	24.9
Uncertain of going to an ERPA (2)	75.5	-
<i>Sub-total</i>	(52.9)	24.9
Total Available	(52.9)	24.9

Mexico and Peru are excluded under the scenario of 16 Programs.

LOI & ERPA Commitments

Country	Max LOI volume	ERPA contract volume	ERPA Contract value (\$ million)	HFLD	HFLD proportion
Signed ERPAs (6)					
DR Congo	10.0	11.0	55.0	11	
Chile	5.2	5.2	26.0		
Cote D'Ivoire	16.5	10.0	50.0		
Ghana	18.5	10.0	50.0		
Mozambique	8.7	10.0	50.0		
Vietnam	10.3	10.3	51.5		
Waiting for co-signature by the Program Entity (1)					
Fiji	3.6	2.5	12.5		
No objection received (3)					
Costa Rica	12.0	12.0	60.0		
Indonesia	22.0	22.0	110.0		
Lao PDR	8.4	8.4	42.0		
Agreed Term Sheets (6)					
Dominican Republic	7.5	5.0	25.0		
Guatemala	10.5	10.5	52.5		
Madagascar	16.4	10.0	50.0		
Nepal	14.0	9.0	45.0		
Nicaragua	11.0	9.5	47.5		
Republic of Congo	11.7	8.4	42.0	8.4	
Countries uncertain of going to an ERPA (2)					
Mexico	8.7	8.7	43.5		
Peru	6.4	6.4	32.0		
TOTAL	201.4	168.9	844.5	19.4	11%

- Committed funding = \$874.5 million
- Committed through contract volumes in signed ERPAs of 56.5 m tons = \$282.5 million

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
- 6 ERPAs have been signed: total committed \$282.5 million
 - DRC ERPA signed September 2018
 - Mozambique ERPA signed January 2019
 - Ghana ERPA signed June 2019
 - Chile ERPA signed December 2019
 - Cote d'Ivoire and Vietnam ERPAs signed October 2020
- 1 ERPA waiting for counter-signature by the Program Entity (Fiji)
- 3 ERPAs received 'no objection' and to be signed before Nov 30, 2020 (Costa Rica, Indonesia, and Lao PDR)
- 3 ERPAs expected to go for 'no-objection' before mid-Nov 2020 (Dominican Republic, Madagascar, and Nepal)
- 3 ERPAs planned to go for 'no-objection' by end Nov 2020 (Guatemala, Nicaragua, and ROC)

Update on signed ERPAs

- **DRC**

- 5 out of 6 ERPA conditions of effectiveness (COE) have been fulfilled
- Final BSP submission is the last pending COE. The BSP will be finalized to take into account the revised reference level.

- **Mozambique**

- ERPAs became effective in February 2020.
- ERPAs have been amended to include retroactive ERs from May 16, 2018 (date of ERPD unconditional approval by the Carbon Fund)
- Monitoring report for the first verification for the reporting period May 16, 2018 – Dec 31, 2018 was submitted in August 2020. First verification is currently in progress. First payment is anticipated between April and June 2021.
- Expected ERs for this first reporting period are 1.34 million tons

Update on signed ERPAs (contd.)

- **Ghana**

- ERPAs became effective in April 2020
- Upfront advance payment of \$1.3 million under the Tranche B ERPA was made in August 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) has been completed
- Monitoring report for the first verification expected to be submitted in December 2020 for reporting period Jun 11, 2019 - Dec 31, 2019

- **Chile**

- Two of the four COEs have been fulfilled.
- Remaining to be fulfilled are final BSP and the subsidiary agreements. The government is conducting additional consultations on the BSP which were delayed due to COVID and changes in the government team. Due to this Chile has requested for extending the ERPA effectiveness period to April 2021 to allow time to complete these consultations and incorporate into the final BSP.
- **Vietnam & Cote d'Ivoire** – both countries will now be focusing to reach effectiveness as early as possible.

Status of ERPA negotiations

ERPA Commercial Terms

- Fiji ERPAs pending counter-signature by the Program Entity
- Costa Rica, Indonesia, Lao PDR – no objection received from CFPs. Internal World Bank clearance in progress prior to ERPA signature
- Dominican Republic, Madagascar, Nepal – no objection in progress
- Guatemala, Nicaragua, Republic of Congo – expected to go for no objection by end of November

Benefit Sharing Plans

- Costa Rica, Dominican Republic, Fiji, Guatemala, Indonesia, Lao PDR, Madagascar, Nepal – Advanced draft BSPs published on FCPF website
- Nicaragua, Republic of Congo – review by Carbon Fund Participants in progress

ER Title Transfer documentation

- Dominican Republic, Madagascar, Nepal – received
- Guatemala, Nicaragua, Republic of Congo – in progress

Expected timeline for ERPA signatures

Timeline	Countries	Number
Already signed	Chile, Cote d'Ivoire, DRC, Ghana, Mozambique, Vietnam	6
By November 30, 2020	Fiji, Costa Rica, Indonesia, Lao PDR,	4
By December 31, 2020	Dominican Republic, Madagascar, Nepal	3
By January 31, 2021	Guatemala, Nicaragua, Republic of Congo	3
Uncertain	Peru, Mexico	2
Total		18

ERPA Signing Deadline extension

- ERPA Signing deadline currently 30 November 2020
- 1 ERPA pending counter-signature, 3 ERPAs received no objection, 3 ERPAs are under no objection, 3 planned for no objection by end November 2020.
- Possible extension to ERPA signing deadline
 - Discuss possibility of December 2020, January 2021 or different deadlines for programs at different stages in process



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

¹ June 2020

² For respective reference period

	Unit: [million tCO ₂ e/year]	HFLD Adjustment (% of total emissions)	Emissions ³	Removals ³	Effectiveness (% estimate, indicative)
Final ER-PD ¹	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	28%
	Costa Rica		9.3	-5.2	12%
	Cote d'Ivoire		9.7	-0.1	58%
	Dominican Rep		3.8	-3.1	18%
	Fiji		3.6	-2.0	12%
	Ghana		45.2	-0.1	6%
	Guatemala		15.3	-2.2	20%
	Indonesia		68.4	0.0	25%
	Lao PDR		10.5	-2.0	26%
	Madagascar		11.5	-0.1	34%
	Mexico		24.0	0.0	25%
	Mozambique		6.5	0.0	38%
	Nepal		1.6	-0.7	98%
	Nicaragua		16.6	-1.0	16%
	Peru		33.8	0.0	17%
Vietnam		10.9	-6.3	24%	
	Total	12.9 (4%)	334.3	-36.6	

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)

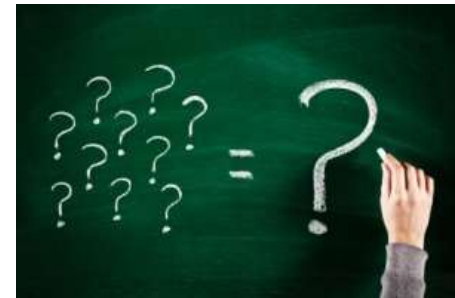
2. Program Effectiveness (*percentage change in rate of emissions or removals during program implementation*)

- 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



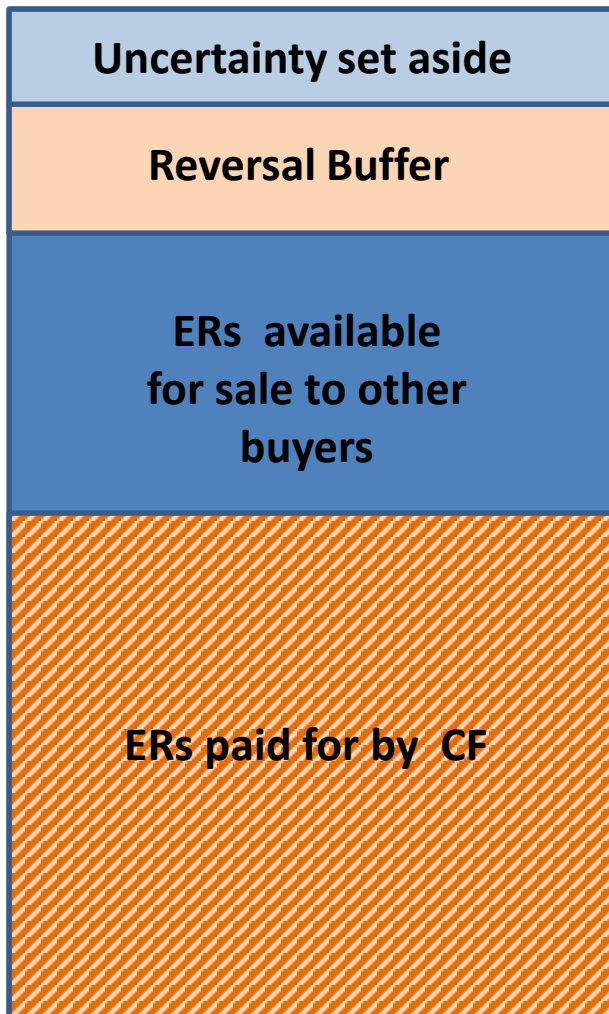
6. Portfolio attrition



Carbon Accounting

Calculation of Emission Reductions (ERs)

Total ER Volume



- Subtract the reported and verified emissions and removals from RL
- Set aside number of ERs to reflect the level of uncertainty associated with the estimation of ERs (percentage of ER Volume)
- Set-aside number of ERs in CF Buffer to deal with risk of Reversals
- CF will buy percentage of the ER Volume
- 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	Fiji	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%	8%	8%	0%	4%	9%	4%	15%	15%	4%	11%	8%	0%	4%	12%	4%	0%	4%
Reversal Buffer set-aside	21%	20%	23%	13%	23%	15%	26%	20%	23%	26%	23%	28%	21%	30%	11%	22%	24%	21%
Share offered to Carbon Fund	80%	46%	86%	95%	44%	90%	67%	79%	90%	51%	77%	65%	29%	92%	72%	90%	36%	56%
ERPA Term	7.05	5.78	4.05	7.01	4.17	4.09	5.48	5.56	4.09	5.54	6.53	6.53	7.15	6.63	6.53	4.09	4.09	6.92
LOI drop rate	0%	0%	20%	0%	0%	5%	0%	0%	15%	0%	0%	5%	50%	0%	5%	15%	50%	0%

... and examine the outcome!

ER-PD Version	[million tCO ₂ e]	Net emission reductions	ER Volume in CF portfolio			Buffer	
		< historical*	Average*	Max	Min	Uncertainty*	Reversal*
Oct-16	Chile	17.7	10.2	18.6	2.6	1.4	2.7
May-16	Congo, Dem Rep of	51.2	28.2	40.1	16.9	6.7	7.1
Dec-17	Congo, Rep of	8.9	17.7	20.2	15.4	2.5	5.3
Jul-17	Costa Rica	17.9	13.8	21.0	6.7	0.0	2.1
Apr-19	Cote d'Ivoire	18.7	6.0	9.0	2.8	0.7	1.8
Jun-19	Dominican Republic	4.2	2.8	4.3	1.4	0.4	0.5
Jun-19	Fiji	8.4	4.0	6.8	1.3	0.3	1.4
Apr-17	Ghana	31.6	17.0	32.8	1.5	4.7	4.3
May-19	Guatemala	10.5	5.6	8.8	2.4	1.6	1.7
May-19	Indonesia	106.2	38.2	59.3	15.4	4.2	13.4
May-18	Lao, PDR of	20.6	10.8	14.1	7.0	2.3	3.2
May-18	Madagascar	22.0	9.6	14.2	5.3	1.8	3.7
Nov-17	Mexico	42.5	9.7	13.3	6.2	0.0	2.6
Apr-18	Mozambique	21.4	11.1	16.5	5.9	0.9	4.7
May-18	Nepal	8.6	4.8	7.2	2.7	1.0	0.6
May-19	Nicaragua	8.8	5.4	10.3	0.7	0.4	1.5
Jun-19	Peru	17.9	4.9	9.3	0.4	0.0	1.5
Jan-18	Vietnam	29.7	12.6	16.4	8.9	1.2	3.4

Aggregate Simulated Portfolio at CF22

ER-PD Version	[million tCO ₂ e]	Net emission reductions	ER Volume in CF portfolio			Buffer	
			< historical*	Average*	Max	Min	Uncertainty*
	Total	446.8	212.6	322.0	103.4	30.0	61.5



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 when most of the ERPAs are signed**

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

1. “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	Program ERs	Risk Factor (% delivery)	Risk- Adjusted Program ERs	Expected ERPA Delivery		
				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 291 million (over \$1.46 billion @ \$5 per ton)
 - Risk factor (% delivery) of between **25% and 67%** across programs
 - Results in a portfolio delivery of around **120 million** risk-adjusted ERs over ERPA periods (**\$600 million @ \$5 per ton**)
 - ER estimates based on:
 - Latest versions of ERPDs
 - Contracted volumes and expected contract volumes
 - Mexico still included in the calculations.
 - Without Mexico, results estimated around 110 million risk-adjusted ERs over ERPA periods (\$550 million @\$5 per ton)

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
 - **Numbers remain conservative pre-ERPA signature**

Carbon Fund: Portfolio Management: Summary

- Available for purchase of ERs: approximately \$791.6 million
- Assuming \$5 per ton
- Monte Carlo: Average \$1.06 billion (212.6 million tons)
- ER delivery risk assessment model: around \$600 million (120 million tons)
- LOI values: 201.4 million tCO₂e @ \$5 per ton = \$1 billion (x 2/3rds = \$671 million)
- At this stage in developing the portfolio these numbers indicate that the delivery risks remain difficult to assess in many programs and diversification across a number of programs is important
- Available monies are wholly allocated so will need to continue to make decisions on contract volumes going forward

Portfolio Management: Historical Comparisons

	CF15	CF16	CF17	CF18	CF19	CF20	CF21	CF22
Available for purchase of ERs (\$m)	681	681	844	857	840	839	816	791.6
LOI maximum volume (m tons)	235	213	213	213	213	213	201.4	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	213
Delivery Risk Assessment (m tons)	70-90	70-90	90	90	90	90	102	120

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

Worth highlighting

- Possible extension of ERPA signing deadline of 30 November 2020
 - Discuss possibility of December 2020, January 2021 or different deadlines for programs at different stages in process



THANK YOU!

www.forestcarbonpartnership.org