Standardized Crediting Framework
Rwanda Pilot

Second Capacity Building Workshop

Agenda

Time			Description	Presenter
8:30	-	9:00	Registration; Tea and Coffee	
9:00	-	9:15	Welcome and Opening by REMA & World Bank	REMA, WB
9:15	-	10:00	Context: crediting under Paris Agreement, CDM transition	Consulting team
10:00		10:45	SCF concept for Senegal and Rwanda Lessons learned so far from SCF Senegal Pilot on rural electrification	Consulting team
10:45	-	11:15	Tea break	
11:15	-	11:45	Rwanda SCF Pilot governance issues and proposals	Consulting team
11:45		12:30	Rwanda SCF Pilot technical issues: scope, eligibility, project cycle	Consulting team
12:30		13:30	Lunch	
13:30	-	14:30	Rwanda SCF Pilot technical issues: methodology, baselines, other issues	Consulting team
14:30	-	15:00	Discussion and next steps	All
15:00			Closing	Chair

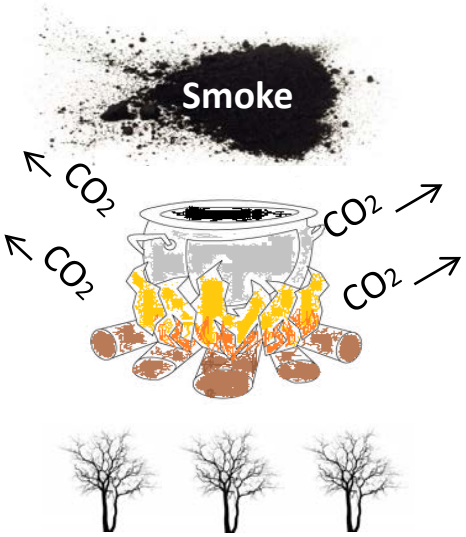
Technical issues: methodology and baseline

SCF Rwanda Pilot: Second Capacity Building Workshop
14 November 2018

Introduction and background

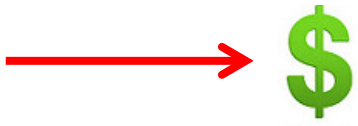
Basic carbon credit concept

1) Baseline

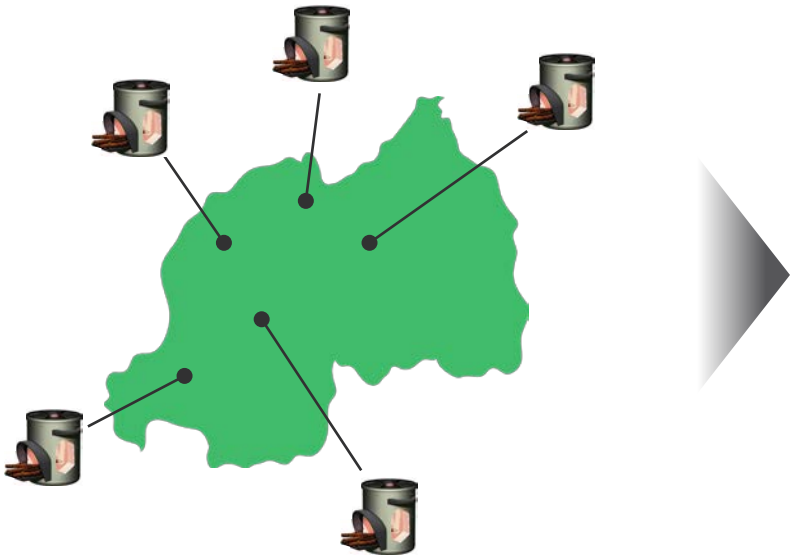


2) Project

Quantify savings



Objective



Volume of
Emission Reductions

- Standardizing the conversion from **Implementation** to **Emission Reductions** achieved.
- Developing a methodology that **fits the pilot program** (Inyenyeri) but is **flexible enough to be relevant for other programs** that will join the SCF later

Calculations

How are emission reductions calculated?

Emission reductions by program device of type *i* and batch *j* during year *y* in tCO_2e
Calculated

$$ER_y = \sum_i \sum_j ER_{y,i,j} - LE_y$$

Emission reductions achieved during year *y* in tCO_2e
Calculated

Leakage emissions in year *y*
Default value

*Emission Reductions (ERs) are claimed as the program is introducing **more efficient cooking devices** resulting in a net saving of non-renewable biomass.*

*Less NRB burned = Less emissions generated = **Emission Reductions***

How are emission reductions calculated?

Quantity of woody biomass that is saved in tonnes per cookstove device
Calculated

Share of operating program devices
Monitored

Fraction non-renewable biomass
Standardized

Baseline emission factor
Default value

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times S_{y,i,j,operating} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{fuel}$$

Number of program devices
Monitored

Adjustment to account for any continued use of baseline stoves
Default value

Net calorific value
Default value

Calculating $B_{y,savings}$

$$ER_{y,i,j} = (B_{y,savings,i,j} \times N_{y,i,j} \times S_{y,i,j,operating} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{fuel}) - LE_y$$

Five options available under the SCF:

1. **Option 1** Thermal Energy output
2. **Option 2** Kitchen Performance Test
3. **Option 3** Water Boiling Test based on baseline consumption
4. **Option 4** Water Boiling Test based on biomass consumption in program
5. **Option 5** Water Boiling Test based on briquettes/pellets consumption

Calculating $B_{y,savings}$ | Option 3

Option 3: Water boiling test based on baseline consumption

$$B_{y,savings,i,j} = B_{old,i,j} \times \left(1 - \frac{\eta_{old,i,j}}{\eta_{new,i,j}}\right)$$

All parameters as defined previously (Option 1 & 2)

Calculating $B_{y,savings}$ | Option 5

Option 5: Water boiling test based on briquettes/pellets consumption

*For households that switch **from using primarily wood fuel** to biomass briquettes/pellets:*

$$B_{y,savings,i,j} = (B_{y,pellets,i,j} \times \frac{\eta_{new,i,j}}{\eta_{old,i,j}} \times \frac{NCV_{pellets}}{NCV_{wood}}) - (B_{y,pellets,i,j} \times CF_{pellets})$$

Quantity of pellets used by program devices in tons per device
Monitored (annually)

Conversion factor of woody biomass to pellets
Fixed (manufacturer)

*For households that switch **from using primarily charcoal** to biomass briquettes/pellets:*

$$B_{y,savings,i,j} = (B_{y,pellets,i,j} \times \frac{\eta_{new,i,j}}{\eta_{old,i,j}} \times \frac{NCV_{pellets}}{NCV_{charcoal}} \times CF_{charcoal}) - (B_{y,pellets,i,j} \times CF_{pellets})$$

Conversion factor of woody biomass to charcoal
Default value

Calculating $B_{y,savings}$ | Option 5

Option 5: Biomass briquettes/pellets used in Program Activity

*This methodology also permits the **claiming of additional emission reductions from the use of renewable biomass briquettes/pellets** to replace fuelwood or charcoal e.g. from sawdust or plantation wastes*

$$BE_y = B_y \times fNRB_{,y} \times NCV_{biomass} \times EF_{fuel}$$

Quantity of woody biomass that is substituted or displaced in tonnes by the use of renewable biomass as fuel in program device
Calculated

$$B_y = B_{y,pellets,i,j} \times N_{i.E,y} \times 0.95 \times 0.95$$

Adjustments for leakage and exceptional use of other biomass
Default value

Quantity of pellets used by program devices in tons per device
Monitored (annually)

Share of program devices exclusively burning renewable biomass
Monitored (annually)

*If this option is option is chosen, additional ERs are equal to BEy calculated above, as there are **no further program emissions** (only use of residuals) and **leakage has already been taken into consideration***

Calculating $B_{y,savings}$ | Option 5

Option 5: Biomass briquettes/pellets used in Program Activity

In the process of converting woody biomass to pellets/briquettes, ***mechanical energy is required****. The following equation shall be used to* ***calculate leakage emissions from this process****:*

Average technical transmission and distribution losses
Default value

$$LE_{ECy} = EC_{LE,y} \times EF_{EG,y} \times (1\text{-}TDL_y)$$

Net increase in electricity consumption from processing biomass
Calculated

Emission factor for electricity generation
Default value

$$EC_{LE,y} = EC_{pellets,y} \times B_{y,pellets,i,j} \times N_{y,i,j,operating}$$

Specific electricity consumption for processing, per ton of biomass briquettes/pellets in year y (MWh/ton)
Monitored (annually)

Simplification under the SCF

Simplified approaches under the SCF

- While the SCF pilot will initially have only one program – **the Inyenyeri improved cookstove program** – the methodology is designed to accommodate a wider range of improved cookstove projects in Rwanda over time
- For this reason, additional approaches are included beyond what is used in the Inyenyeri Program of Activities Design Document (PoA-DD) for the CDM
- The SCF methodology simplifies the CDM approach by providing additional default values and simplification in the calculation of some parameters

Simplified approaches under the SCF

Examples of simplification available under the SCF methodology :

Approach in CDM Inyenyeri PoA DD	SCF approach	Rationale
Fraction of non-renewable biomass (*fNRB*) **to be calculated following the CDM tool.**	Fraction of non-renewable biomass (*fNRB*) is **fixed**.	Simplified project set-up, reducing upfront project development costs
Monitoring of $B_{new,KPT,i,j}$ *and* $B_{y=1,new,i,j}$ are both to be **monitored annually.**	Both parameters **permitted to be monitored once every two years**.	Simplification that reduces monitoring effort of project developers
$NCV_{pellets}$ **monitored annually**	$NCV_{pellets}$ **monitored once prior to first verification**, with option to update this during the project.	Simplified monitoring approach, since the NCV is unlikely to change over time
Efficiency of old devices ($\eta_{old,i,j}$) can be either a **default value or established prior to start of implementation based on survey**	Efficiency of old devices ($\eta_{old,i,j}$) is a **fixed default value**	Simplified project set-up, reducing upfront project development costs
Annual quantity of woody biomass that would have been used in the household absence of the project activity ($B_{old,HH}$) to be **calculated**	Annual quantity of woody biomass that would have been used in the household absence of the project activity ($B_{old,HH}$) **fixed** based national statistics and conservative default value	Simplified approach to reduce monitoring efforts

Data and parameters not monitored

Data and parameters not monitored [1/2]

- $\mathbf{f_{NRB}}$ is standardized based on official studies of biomass availability
- Adjustment factor $\boldsymbol{\mu_y}$ related to continued use of baseline stoves is based on default values
- Efficiency of baseline stoves $\boldsymbol{\eta_{old,i,j}}$ is standardized (10% for traditional wood stove, 20% for charcoal stoves)
- Annual quantity of woody biomass that would have been used in the absence of the program activity ($\mathbf{B_{old,i,j}}$, $\mathbf{B_{old,HH}}$, and $\mathbf{B_{old,p}}$) are default values
- **Average number of persons per household** is based on national statistics
- Net calorific value (**NCV**) of non-renewable woody biomass substituted is based on latest IPCC figures
- Conversion factor from woody biomass to charcoal $\mathbf{CF_{charcoal}}$ is taken from Inyenyeri PDD and derived from national and international studies
- Emission factor for woody biomass ($\mathbf{EF_{fuel}}$) is based on latest IPCC figures

Data and parameters not monitored [2/2]

- Leakage emissions (**LE_y**) are calculated using a default value
- **Operating life** of devices implemented comes from manufacturer's information
- Efficiency of program devices ($\eta_{new,i,j}$) is established either by a certified body recognized by the Rwandan government or via WBT. **Linear loss of efficiency** should be accounted for
- Net calorific value of pellets (**$NCV_{pellets}$**) used in the program devices are based on measurement from the manufacturer
- Emission factor for electricity generation for pellet production (**$EF_{EG,y}$**) and average technical transmission and distribution losses (**TDL**) are conservative default values
- Conversion factor from woody biomass to pellets ($CF_{pellets}$) is as per manufacturer information

Monitoring requirements

Monitoring requirements

Parameter	Description	Monitoring frequency			
		Once	*Continuous*	*Annual*	*Every 2 yr*
For all Options					
$N_{y,i,j}$	Number of program devices commissioned		X		
Baseline fuel use	Type of fuel predominantly used before the program (i.e. wood fuel)	X			
$N_{d,HH}$	Number of program devices distributed per household.	X			
Commissioning date	Date of commissioning of batch j or program device i.	X			
Options 1-4 only					
$S_{y,i,j,operating}$	Share of program devices of type i and batch j operating during year y.				X
Option 1 only					
$t_{y,l,j}$	Number of hours of utilization of the device during the year y.				X
Option 2 only					
$B_{new,KPT,ij}$	Annual quantity of woody biomass used in tonnes per program device of type i, measured as per the KPT protocol.				X

Monitoring requirements

Parameter	Description	Monitoring frequency			
		Once	*Continuous*	*Annual*	*Every 2 yr*
Option 4 only					
$B_{y=1,new,i}$	Quantity of woody biomass used by program devices in tonnes per device	X			
Option 5 only					
$B_{y,pellets,i,j}$	Quantity of pellets used by the program devices in tonnes per device			X	
$EC_{pellets,y}$	Electricity consumption for briquette/pellet production			X	
$N_{i.E,y}$	Number of program devices exclusively burning renewable biomass.			X	
Diesel	Quantity of diesel used			X	

Monitoring requirements | Inyenyeri

Parameter	Description	Monitoring frequency			
		Once	*Continuous*	*Annual*	*Every 2 yr*
For all Options					
$N_{y,i,j}$	Number of program devices commissioned		X		
Baseline fuel use	Type of fuel predominantly used before the program (i.e. wood fuel)	X			
$N_{d,HH}$	Number of program devices distributed per household.	X			
Commissioning date	Date of commissioning of batch j or program device i.	X			
Option 5 only					
$B_{y,pellets,i,j}$	Quantity of pellets used by the program devices in tonnes per device			X	
$EC_{pellets,y}$	Electricity consumption for briquette/pellet production			X	
$N_{i.E,y}$	Number of program devices exclusively burning renewable biomass.			X	
Diesel	Quantity of diesel used			X	

*Therefore Inyenyeri only has to monitor (a) stoves distributed, (b) pellets sales and (c) energy consumed to make the pellets = all part of the program's **normal business model***