CarbonFix Standard

Version 3.0

Criteria & Methodology

Valid since: August 2009

Foreword

As it became clear that the criteria of the Kyoto Protocol would not have the desired affect of promoting the establishment of new forests, the CarbonFix Standard (CFS) was created and released at the Climate Conference in Bali in December 2007.

As a result of feedback from over 50 organisations, the technical board has now released Version 3.0 of the CarbonFix Standard.

The non-profit association CarbonFix was founded in 1999 to follow the UN climate process and to promote the potential of climate forestation projects. It is registered under German law and administrated by the CarbonFix Secretariat. The CFS is controlled and directed by its Technical Board, which consists of experts from the fields of forestry, ecology and development aid.

The CarbonFix Standard (CFS) serves the purpose of ensuring high-quality forestation projects which are implemented worldwide. CarbonFix certified projects sequester carbon, restore forests and bring benefits to local people and the environment.

CFS enables project developers to sell their certificates ex-post as well as in ex-ante form. This enables more capital for new projects and therefore opens a much greater potential to reforest depleted or depredated land.

In order to ensure the permanence of its credits, the CarbonFix association implemented a buffer system which holds back 30% of all certificates in order to compensate possible project shortfalls.

Combined certification

In order to provide the most practical solutions for project developers, the CarbonFix Standard accepts criteria of other credible certification schemes in order to avoid double work.

The technical board thus far recognizes the certification schemes of the Forest Stewardship Council (FSC) and the Climate Community and Biodiversity Association (CCBA).

Combined certifications are possible if the project is certified by a CarbonFix recognized certification scheme, or intends to do so during the same certification process.

The CarbonFix Standard consists of 3 documents

I. Terms

The CFS document 'Terms' defines the technical wording used within the standard. All words underlined within the CFS documents are defined under this chapter.

Words which are fully underlined are defined directly on the page, with a footnote.

II. Criteria & Methodology

The document 'Criteria & Methodology' includes the different criteria a project has to meet in order to become successfully certified. It is clustered in 4 main chapters as shown by the graph.

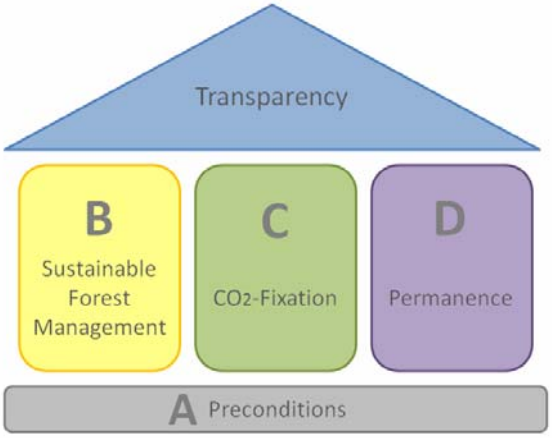
The CarbonFix Standard can be used as a stand-alone standard or in combination with the certification schemes of FSC as well as CCBA. In case a project is already certified according to one of these schemes, evidence on certain criteria of the CarbonFix Standard is already given. To avoid double work for the project developer CarbonFix accepts this proof. Therefore certain CarbonFix documentation (templates) does not have to be uploaded.

The following table gives an overview on which criteria of the CarbonFix Standard are covered by other certification schemes.

In case the CarbonFix Standard is used as stand-alone standard, all criteria described by the standard will have to be fulfilled.

Chapter			FSC	CCBA
		Transparency		
A	01	Eligibility		
	02	Additionality		✓
B	03	Forest Management	(✓)	
	04	Environmental Aspects	✓	✓
	05	Socioeconomic Aspects	✓	✓
C	06	CO_2-fixation		
	07	Project Emissions		
	08	Baseline		
	09	Leakage		
	10	Compensation Activities		
D	11	Capacities	✓	✓
	12	Land & CO_2 Tenure	(✓)	✓

✓ Criteria admitted (✓) Criteria partly admitted



III. Procedures

The Procedures of the CFS describe in detail how project developers can create their login account, upload their information and request for validation. Subsequently, it describes how a project is certified, under which circumstances projects are excluded and how the buffer becomes operational.

It also explains how project developers can sell their CO_2-certificates, what fees CarbonFix charges and how CO_2-certificates are placed into a carbon registry. Furthermore, the different possibilities on how to trade or retire CO_2-certificates are outlined.

How to hand in your evidence?

Evidence on how a project meets the different criteria can be submitted in two ways:

- By the use of pre-set templates. In this case the title of a chapter indicates Template
- By the use of the ClimateProjects system. In this case the title of a chapter indicates Online

How is the evidence assessed by the certifier?

All criteria of the document 'Criteria & Methodology' that have a

- 'point' behind their number (1.) are assessed on the basis of evidence that is submitted through a template or online.
- 'double point' behind their number (1:) do not require the submission of specific information via a template or online, but will still be assessed by the certifier.

How to apply combined certifications?

In case of a combined certification, with CCBA or FSC, the template 'Combined certification' replaces the template normally used. Within this template reference to location of the other documentation has to be given.

Criteria & Methodology

Transparency Online

1. The following information must be submitted online through the ClimateProjects websystem:
   a. Country of the project
   b. A short and long description of the project
   c. A summary giving an overview of the project
   b. Contact information of the project's participants Document generated by ClimateProjects
   e. Pictures (if possible also videos or audio) of the project
   f. A climate diagram from the location of the project - uploaded as a picture ASSISTING DOC: Climate diagram

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3. Shapefiles with the following information must be submitted online through the ClimateProjects websystem:

   a. Project area(s)

   b. Management Units

   c. Land-use classes of the project area
      - At the project start
      - 10 years prior to project start (see chapter '01 Eligibility')

      Land-use classes must be marked as eligible or non-eligible - e.g.
      - Grassland_2007_eligible
      - Shrubland_2007_non-eligible
      - Wetland_2007_non-eligible

   d. Nature conservation areas

   e. Neighbours of the project
      - Individuals, villages, towns, etc.

   f. Infrastructure
      - Roads, rivers, houses, etc.

Shapefile — Shapefile is a file which contains polygons, lines or points - and their GPS positions. These files can be read by mapping-programs such as ArcGIS or FreeGIS.

A. Preconditions

01 Eligibility Template

1. A description of the historical and the current situation of the project area must be given for the last 50 years. This description must include the development of its socioeconomic situation, its changes in land-uses and changes of property rights.

2. Planting area is ONLY eligible, if the land:
   a. is not a forest at the project start +
   b. is planted with trees that result in the creation of a forest +
   c. has not been forest within 10 years prior to the project start OR
      has been forest within 10 years prior to the project start and evidence is given that absolutel
      relation between the project participants and the cause of deforestation exists (e.g. that the f
      destruction was caused by force majeure)

   Criterion 2c must be proven by the interpretation of satellite images, aerial photographs, official maps or land-use records.

3. Planting area is NOT eligible, if the land:
   a. was deforested to generate CO_2-certificates OR
   b. is wetland OR
   c. is situated on ground that is permafrost OR
   d. is agriculture farming land and threatens the local production of staple food through its conversion to forest.

4. Evidence must be given, that in case any agricultural or silvopasture activities are taking place on the project area, they contribute to the aim of creating a forest.

5. Evidence must be given that no project activities will lead to a long-term increase of emissions within the carbon pool 'soil'.

Forest	A forest is defined by the Designated National Authority (DNA) of the projects host-country: http://cdm.unfccc.int/DNA
Permafrost	Grounds of permafrost are defined by the International Permafrost Association - www.solcomhouse.com/permafrost.htm
Satellite images	Cost free satellite images are available from the following webpages: • Global Land Cover Facility: http://glcfapp.umiacs.umd.edu:8080/esdi/index.jsp • USGS: http://eros.usgs.gov
Silvopasture	Silvopasture is the practice of combining forestry and grazing of domesticated animals in a mutually beneficial way.
Staple food	Staple food serves the local population to feed themselves with essential aliments.
Trees	Trees are perennial, woody plants with one dominant sprout that increases its circumference due to secondary growth.
Wetland	Definition of wetland according to the IPCC: 'This category includes land that is covered or saturated by water for all or part of the year (e.g. peatland) and that does not fall into the forest land, cropland, grassland or settlements categories.' Source: IPCC - Good Practice Guidance - Wetlands.

A. Preconditions

02 Additionality Template

Evidence must be given that the project cannot be implemented without the sale of CO_2-certificates. Therefore, the project developer can choose between the following options:

Option 1

1. Evidence is given by an analysis according to the UNFCCC guidelines:
   http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html

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Option 2

2. Evidence is given by:
   a. An official statement of a bank which states that the project would not be feasible without the additional financial means from the sale of CO_2-certifcates +
   b. Evidence that no similar project, without CO_2-certifcates, is being implemented in the surrounding area +
   c. Evidence that the project was planned from the beginning (even before the project start) with the aim of generating CO_2-certificates +
   d. An official statement from a state authority that the planned project is not mandatory by any law or regulation OR
      if it is mandatory, by evidence that these laws or regulations are not systematically enforced

3. A description of the most likely without-project-scenario of the project area must be given.

4. Evidence must be given that the most likely without-project-scenario would not lead to an increase of woody biomass on the eligible planting area.

   If this is not the case, the amount of woody biomass generated long-term (calculated with the same approach as the future CO_2-fixation - see chapter '06 CO_2-fixation') must be used for the parameter 'Baseline woody biomass' - see chapter '04 Baseline'.

5. Evidence must be given that the project contributes to a more sustainable development than the most likely without-project-scenario, in short-, mid- and long-term.

Bank — The bank must be one of the S&P AA- up to AAA rated banks: www.StandardAndPoors.com
Select 'Products & Services' > 'Financial Institutions' > 'Credit Rating List'

B. Sustainable Forest Management

03 Forest Management [Template]

1. A description of the project's silvicutural objectives must be given.

2. Evidence must be given that the borders of the project area, planting area (eligible and non-eligible), management units and nature conservation area are clearly defined and visible in the field.

3. A description of the following tree species characteristics must be given:
   a. Origin and distribution of the tree species (indicate if the species are native or not)
   b. Provenance of the seeds
   c. Main purpose / use of trees
   d. Possible pests and diseases
   e. Time when forest products are foreseen to be used

Note: The following criteria are also required in case of FSC certification

4. Evidence must be given that at least 10% of the project area is managed as a nature conservation area.

5. Evidence must be given that the nature conservation area is protected or managed in order to establish or re-establish the natural ecosystem of this area.

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6. Key figures on the following parameters must be provided:
   a. Project area
   b. Foreseen planting area
   c. Eligible area within the foreseen planting area
   d. Nature conservation area

   In case the areas are fragmented, a table shall give a clear overview.

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7. Information answering the following questions must be submitted through the ClimateProjects websystem for each management unit. [Document generated by ClimateProjects]

• When did the planting start?		[date]
• What tree species were planted?		
• How large is the planting area?		[ha]
• How large is the eligible planting area?		[ha]

The following information is based on calculations from other chapters.

• How much is the future CO_2-fixation?	*06 CO_2-fixation*	[t/CO_2]
• When will the future CO_2-fixation be completed?	*06 CO_2-fixation*	[year]
• How much is the current CO_2-fixation?	*06 CO_2-fixation*	[t/CO_2]
• How much fertilizer was applied?	*07 Project emissions*	[kg of N]
• Was the baseline biomass burned?	*07 Project emissions*	Yes / No
• How much is the baseline?	*08 Baseline*	[t/CO_2]
• How much is the leakage?	*09 Leakage*	[t/CO_2]

Natural ecosystem — The natural ecosystem is a unit of plants, animals, water and soil which would have occurred on the area in case of no human intervention.

B. Sustainable Forest Management

04 Environmental Aspects [Template]

1. A description, including pictures, of the different land-use classes (see chapter 'Transparency' - Point 3c.) of the project area must be given.

   In case significantly different land-use classes are bordering the project area, they must also be described.

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2. Evidence must be given that the project has net-positive ecological impacts.

   Therefore,
   a. positive ecological impacts of the projects must be enhanced and
   b. negative or potential negative ecological impacts must be mitigated.

   Descriptions of the following project characteristics must be given for both points:
   - Soil Nutrients, Erosion
   - Water Quality, Quantity
   - Biodiversity Flora, Fauna
   - Climate Temperatures, Rain

3. Regarding the biodiversity of a project area, all endangered and critically endangered species of the IUCN Red list must be identified and evidence must be given that appropriate activities are put into place to protect them.

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4. Evidence must be given that the use of chemical products (such as herbicides and insecticides) is minimized in its application.

5. Evidence must be given, that the application of chemical products is documented.

6. Evidence must be given, that when chemicals are used, sufficient training and proper equipment is provided to minimize environmental impacts.

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7. Evidence must be given that waste is disposed of in an environmentally appropriate way.

8. Evidence must be given, that 15 meter wide buffer strips along permanent or temporary watercourses (streams, rivers, wetlands) are implemented. These buffer strips must be
   - part of the nature conservation area, OR
   - must be managed according to '06 CO_2-fixation - Option 1b) Conservation forest'.

   In both cases only native tree species are allowed to be planted.

9. Evidence must be given that no flooding irrigation, regular irrigation or drainage is introduced on the project area.

10. In case of forest operations (thinning, harvesting of timber or non-timber products, etc.), evidence must be given that minimal soil disturbance occurs.

11. Evidence must be given that no area-wide ploughing is applied and that mechanized ploughing is limited to the purpose of planting.

12. Evidence must be given that no genetically modified species are being used.

IUCN Red List See website: www.IUCNredlist.org
Genetically modified Genetically modified trees species are defined according to the FSC guideline: FSC-POL-30-602

13. Evidence must be given that the project management is planting native species in mixed stands and in case the timber of the forest is being used, selective harvesting management is applied.

    Otherwise, the project must justify its
    - choice of tree species
    - silvicultural system
    - harvesting method

14. Evidence must be given that all species planted are site-adapted under changing climate conditions.

Native species	Species are defined as native, if their presence on the project area is the result of only natural resources, with no human intervention.
Mixed stands	Mixed forest stands consist of two or more dominant tree species.
Selective harvesting	Selective harvesting is done by the continuous harvest of single trees or groups of trees without lowering the forest stock significantly.
IPCC report	Latest IPCC report: www.grida.no/climate/ipcc_tar - Report 'The Scientific Basis' - Chapter 10

B. Sustainable Forest Management

05 Socio-economic Aspects [Template]

1. Evidence must be given that the project has net-positive socio-economic impacts.

   Therefore,
   a. positive socio-economic impacts of the projects must be enhanced and
   b. negative or potentially negative socio-economic impacts must be mitigated.

   For point a. descriptions of the following aspects must be given:
   - Creation of employment
   - Capacity building
   - Welfare activities

   For point b. descriptions of the following aspects must be given:
   - Stakeholder involvement prior to the project start
   - Displacement of people
   - Spiritual, religious, or other socially important places influenced by the project activities

2. To give further evidence for the criteria 1a. and 1b. a stakeholder consultation must take place a maximum of 3 months before or during the field visit of every certification process.

   For this consultation, all stakeholders must be invited
   - using appropriate means +
   - providing them with sufficient information on the project activities.

   The results of the consultations must be documented.

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3. Evidence must be given that first aid kits are reasonably accessible for the working staff.

4. Evidence must be given that working staff is able to organize itself and voluntarily negotiate with their employers.

5. Evidence must be given that all equipment (tools, machines, etc.) of the working staff are in safe working mode.

6. Evidence must be given that proper protective equipment and training of the working staff is enforced - especially when chemicals are used.

7. Evidence must be given that no children under the age of 16 are working for the project.

8. Evidence must be given that contracts are clearly define and include the following aspects:

   For employees
   a. working hours and leave of absence
   b. duties
   c. salary
   d. modalities on health insurance
   e. modalities on the termination of the contract

   For contractors
   a. tasks (quantity, quality, time)
   b. payment
   c. modalities on the termination of the contract

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9. Evidence must be given that working staff is preferably employed from areas close to the project.

10. Evidence must be given that throughout the project activity project stakeholders are able to address their concerns to the management staff.

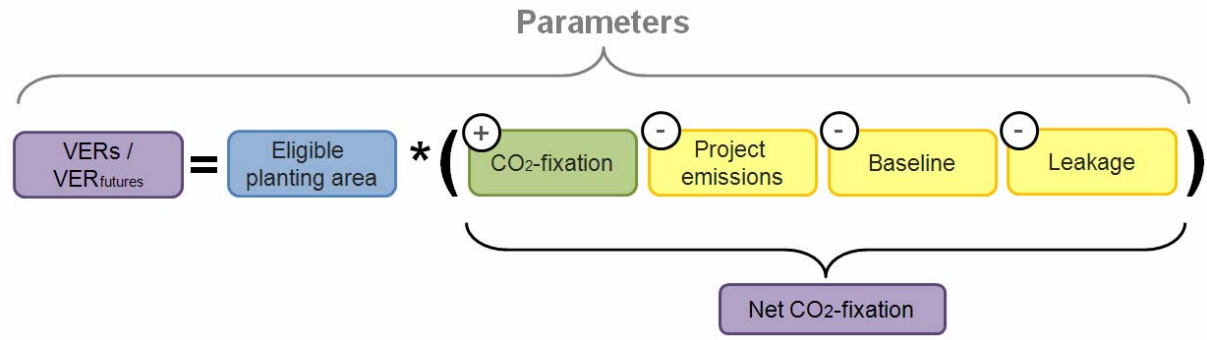
11. Evidence must be given that throughout the project activity any concerns by project stakeholders are documented and appropriately responded to by the management staff.

C. CO_2-fixation

For detailed information on the background of the CFS methodology, the document 'CFS methodology' can be downloaded from www.CarbonFix.info/Documents

Calculation of VERs / $VER_{futures}$

To determine the amount of VERs / $VER_{futures}$ of an area, the following formula must be applied:



The formula must be applied individually for every management unit.

After the different parameters of the VER / VER_{future} calculation are determined using the templates, they must also be submitted online in the ClimateProjects websystem - see chapter '03 Forest Management'.

The system will automatically multiply the eligible planting area times the net CO_2-fixation and deduct the buffer.

VERs / $VER_{futures}$
= Eligible planting area [ha] * Net CO_2-fixation [tCO_2/ha] * -30% buffer

For the calculation of the parameters CO_2-fixation, Baseline and Leakage, the following carbon pools are preset to be assessed:

Carbon Pools		*Includes*	CO_2-fixation	Baseline	Leakage
Woody biomass	Aboveground	*Stem, branches, bark*	Selected	Selected	Selected
	Belowground	*Tree roots*	Selected	Selected	
Non-woody biomass	Aboveground	*Grass*		Selected	
	Belowground	*Grassroots*		Selected	
Soil		*Soil organic content*			
Harvested wood (timber & energy wood)		*Furniture, construction material, …*			

Positive climatic affects, other than those caused by the projects forestation activities (such as those from agriculture activities, silvopasture or positive leakage), cannot be accounted for.

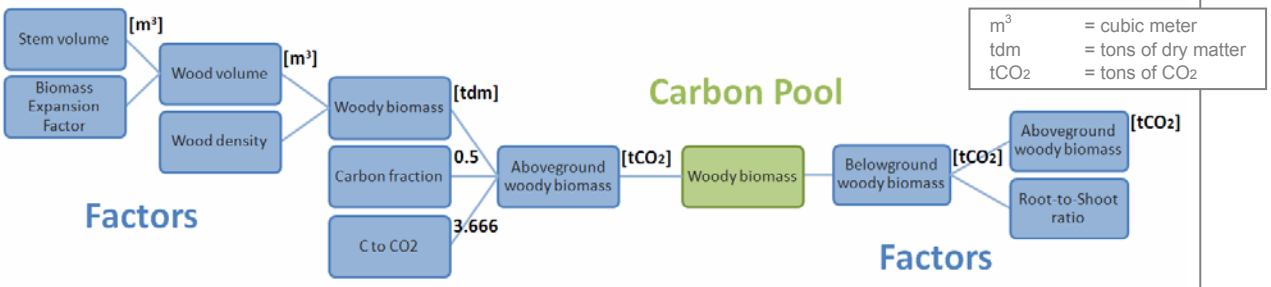
Silvopasture — Silvopasture is the practice of combining forestry and grazing of domesticated animals in a mutually beneficial way.

Conversion of Units

Most of the variables used in forestry appear in a different unit than tons of CO_2. Therefore, they need to be converted. During this 'conversion process' different factors must be considered. The following page describes the conversion of 'woody' and 'non-woody' carbon pools. These pools are relevant for the calculation of CO_2-certificates according to the CFS.

Woody biomass

The following graph shows which factors are needed to convert Stem volume [m^3 of wood] to tons of CO_2.



Aboveground Woody biomass
= Stem volume * Biomass Expansion Factor * Wood density * Carbon fraction * C to CO_2 factor

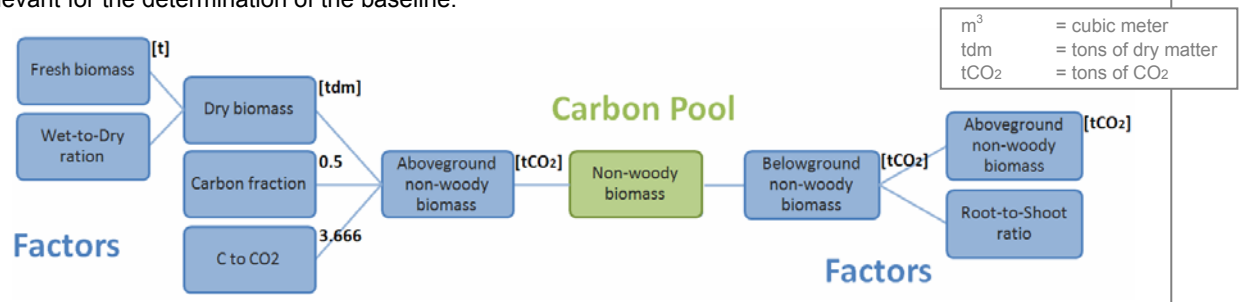
Belowground Woody biomass
= Aboveground Woody biomass * Root-to-Shoot ratio

The different factors can be influenced by one or several of the following attributes and must therefore be considered during the calculations:

- Some Biomass Expansion Factors (BEF) already include the Root-to-Shoot ratio.
- Sometimes the Stem volume is calculated over-bark and sometimes under-bark.
- The Stem volume is based on a specific cut diameter (x cm). The BEF must relate to this.
- Most Root-to-Shoot ratios are calculated from the Wood volume (including branches and litter), but some are based on the Stem volume.

Non-woody biomass

The following graph shows which factors are needed to convert fresh biomass [tons] to tons of CO_2. This is relevant for the determination of the baseline.



Aboveground Non-woody biomass
= Fresh biomass * Dry-to-Wet ratio * Carbon fraction * C to CO_2 factor

Belowground Non-woody biomass
= Aboveground Non-woody biomass * Root-to-Shoot ratio

For all calculations:

- 0.5 is used as 'Carbon fraction'
- 3.666 is used to convert 'C to CO_2'

Note that a 'ratio' relates to a relative figure (0.4), whereby a 'factor' relates to a calculative figure (1.4).

Conservative Approach

All parameters of the net CO_2-fixation used, must be derived from the best available scientific sources. In their synergy, they must lead to a conservative calculation approach. This means that in case of uncertainties:

- the CO_2-fixation should be underestimated, and
- the Project emissions, Baseline, and Leakage should be overestimated

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In case no rigorous scientific information is available, the following values can be used:

CO_2-fixation

- Wood density = 0.3
- BEF = 1.1
- Root-to-Shoot ratio = 0.1
- Form factor = 0.4 (relevant for inventories)

Baseline or Leakage

- Wood density = 0.7
- BEF = 4.0
- Wet-to-Dry ratio = 0.5
- Root-to-Shoot ratio = 4.0 (for non-woody biomass)
- Root-to-Shoot ratio = 0.8 (for woody biomass)
- Form factor = 0.6 (only relevant for forest inventories)

C. Net CO_2-fixation

06 CO_2-fixation Template

To determine the parameter CO_2-fixation - which can be regarded as present CO_2-fixation as well as future CO_2-fixation - the following carbon pools are preset to be assessed:

Carbon Pools		*Includes*	CO_2 fixation
Woody biomass	Aboveground	*Stem, branches, bark*	Selected
	Belowground	*Tree roots*	Selected

A.1.3.

CO_2-fixation [tCO_2/ha]
= CO_2-fixation woody biomass [tCO_2] / Area of management unit [ha]

1: The future CO_2-fixation is determined by a management unit specific growth-model in which stem volume is converted from m^3 of stem volume into tons of CO_2, using the conservative approach.

Evidence must be given, that growth-models are based on credible scientific information and site-adapted factors.

2: Once the average tree height within a management unit exceeds 3 meters, the present CO_2-fixation must be determined. Hereby, the guideline 'Forest Inventory' must be applied. ASSISTING DOC: Forest Inventory

3: Evidence must be given, that growth-models (respectively the amount of the future CO_2-fixation) are being adjusted according to the latest information gained through the assessment of the present CO_2-fixation.

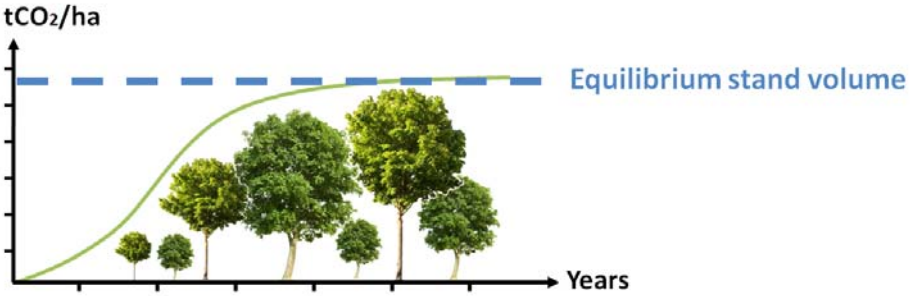
In case of discrepancies, they must apply the compensation activities - see chapter '10 Compensation Activities'.

Depending on the applied silvicultural methods, one of the following calculative options must be used to determine the future CO_2-fixation:

Option 1 - a) Selective harvesting or b) Conservation forest

4: Evidence must be given by the projects characteristics (tree species, project participants, etc.) and its silvicultural objectives that the forests will be used with a selective harvesting regime or will be conserved (no use of timber).

5: In case of selective harvesting or conservation forest, the future CO_2-fixation is based on the equilibrium stand volume.



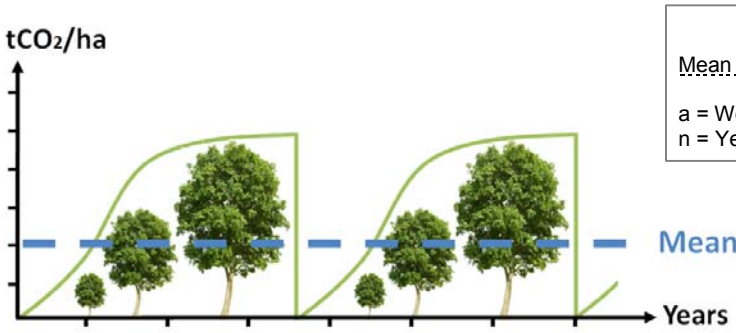
In case the equilibrium stand volume is not reached by year 50, the future CO_2-fixation is determined based on the stand volume in year 50.

Applying this option, the year of delivery is equal to the year when the equilibrium stand volume is reached.

Selective harvesting — Selective harvesting is done by the continuous harvest of single trees or groups of trees without lowering the forest stock significantly.

Option 2 - Rotation forestry

6: In case of rotation forestry, the future CO_2-fixation is based on the mean stand volume during the first rotation period.



Mean stand volume = $\frac{\sum_{0-n} a_n}{n}$

a = Wood volume (m^3) in year n
n = Years of the first rotation period

In case the first rotation period takes longer than 50 years, the future CO_2-fixation is based on the mean stand volume within the first 50 years.

Applying this option,

- the year of delivery is equal to the year when the mean stand volume is reached
- the present CO_2-fixation is not able to exceed the amount of future CO_2-fixation

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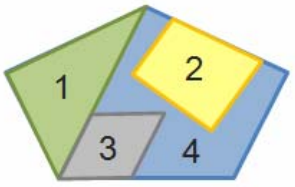
Note that the graph above only shows the rotation system within one management unit. Projects normally consist of multiple management units.

Hereby, it is possible that management units are managed in different ways.

Example:

Management Unit (MU)	Planting year	Option of CO_2-fixation
1	2008	Option 1b) - Conservation forest
2	2008	Option 1a) - Selective harvesting
3	2009	Option 2 - Rotation forestry
4	2010	Option 1b) - Conservation forest



C. Net CO_2-fixation

07 Project Emissions Online

The following parameters do not require the use of a template. They must be submitted online through the websystem of ClimateProjects.

1: In order to account for project emissions due to the use of fossil energy within the project (e.g. by machines, flights, etc.) 0.5% of the future CO_2-fixation will be deducted.

The ClimateProjects system automatically deducts these emissions from the management unit.

2. In case fertilizer is used, 0.005 tCO_2 per kg of nitrogen (N) must be deducted.

By entering the kg of N in the ClimateProjects websystem (see chapter '03 Forest Management'), these emissions are automatically deducted from the management unit.

3. In case the biomass of the baseline is burned on the field for the purpose of land preparation, an additional 10% of the baseline emissions must be accounted for. This is due to other greenhouse gases (N_2O and CH_4) that are released during the burning process.

By selecting this option within the ClimateProjects websystem (see chapter '03 Forest Management'), the additional emissions are automatically deducted from the respective management unit.

C. Net CO_2-fixation

08 Baseline [Template]

To determine the parameter baseline the following carbon pools are preset to be assessed:

Carbon Pools		*Includes*	Baseline
Woody biomass	Aboveground	*Stem, branches, bark*	Selected
	Belowground	*Tree roots*	Selected
Non-woody biomass	Aboveground	*Grass*	Selected
	Belowground	*Grassroots*	Selected

Baseline [tCO_2/ha]
= (Baseline woody biomass [tCO_2] + Baseline non-woody biomass [tCO_2]) / Eligible planting area [ha]

1: The baseline is the woody and non-woody biomass on the eligible planting area at the project start.

The calculation can be done in two different ways:

a. By executing field measurements.
Hereby, the 'Forest Inventory' guideline shall be applied. [ASSISTING DOC: Forest Inventory]

b. By estimating the biomass in reference to similar areas. Hereby,
- regional and national default values are preferable
- international default values shall only be used if other values are not available

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For examples of the baseline determination, the document 'Example calculations' can be downloaded from www.CarbonFix.info/Documents

International default values — The IPCC Good Practice Guide and FAO provide many different international default values: Chapter 3, Annex 3A.1
www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_contents.htm
www.fao.org/docrep/W4095E/w4095e00.htm

C. Net CO_2-fixation

09 Leakage [Template]

To determine the parameter leakage emissions, the following carbon pools are preset to be assessed:

Carbon Pools		*Includes*	Leakage
Woody biomass	Aboveground	*Stem, branches, bark*	Selected

Leakage [tCO_2/ha]
= Leakage aboveground woody biomass [tCO_2] / Eligible planting area [ha]

1: Leakage is caused by an increase of emissions outside of the project area as a result of the project activity.

Leakage emissions can be caused due to a shift in the following activities:

a. fuelwood use
b. charcoal burning
c. timber harvesting
d. agricultural farming
e. resettlement
f. livestock grazing

Depending on the category of leakage selected, the following formulas must be applied:

Formula for category a. b. c. d. and e.

Leakage aboveground woody biomass [tCO_2]
= % of displacement [%] * CO_2-stock [tCO_2/ha] * Area [ha]

% of displacement	= displaced activities which will have impacts on the carbon pool aboveground woody biomass outside the project area. The factor is determined by: 1. credible estimations, or 2. a representative survey
CO_2-stock	= average CO_2-stock of the land where the activity will be displaced to If it is not known where the activity will be displaced to, it is possible to take: For category a. and b. ● the CO_2-stock of the area where the activity took place For category c. d. and e. ● the CO_2-stock of a natural forest in the project's host-country
Area	= land within the project area affected by the activity - before the project start

Formula for category f.

Leakage aboveground woody biomass [tCO_2]
= % of displacement [tCO_2] * CO_2-stock [tCO_2/ha] * Heads [head] * Capacity [ha/head]

% of displacement	= displaced activities which will have impacts on the carbon pool aboveground woody biomass outside the project area. The factor is determined by: 1. credible estimations, or 2. a representative survey
CO_2-stock	= average CO_2-stock of the land where the activity will be displaced to If it is not known where the activity will be displaced to, it is possible to take: ● the CO_2-stock of a natural forest of the projects region
Heads	= number of livestock that will be displaced outside the project area. The factor is determined: 1. credible estimations, or 2. a representative survey
Capacity	= sustainable grazing capacity of the area where the livestock will be displaced to

For examples of the leakage determination, the document 'Example calculations' can be downloaded from www.CarbonFix.info/Documents

C. Net CO_2-fixation

10 Compensation Activities Online

VERfutures

1: Compensation activities must be implemented in case the adaptation of the amount of VERfutures leads to an amount of VERfutures that is lower than the amount that has already been assigned to CO_2-buyers.

A decrease of the future CO_2-fixation may be due to the adjustment of the preset growth-model. Such adjustment can be caused from changing the silvicultural system, or from new information from forest inventories.

2: Shortfalls of the future CO_2-fixation must be compensated by the allocation of VERfutures from
a. other management units of the same project OR
b. other CFS certified projects

4: In case a management unit is destroyed, compensation activities might not be necessary if the same or similar tree species are replanted which will have the same amount of future CO_2-fixation.

5: Replantings, as part of the compensation activity, must take place in the next possible planting season.

VERs

6: Compensation activities must be implemented in case the adaptation of the amount of VERs leads to an amount of VERs that is lower than the amount that has already been assigned to CO_2-buyers.

A decrease of the current CO_2-fixation may be due to the destruction of forest resulting from:
- Force majeure (wind, drought, flood, erosion, earthquakes, etc.)
- Lack of protection (browsing, encroachment, fires, etc.)
- Diseases
- Mismanagement (poor establishment, maintenance, etc.)

7: Shortfalls on the current CO_2-fixation must be compensated by the allocation of VERs from
a. other management units of the same project OR
b. other CFS certified projects

8: The process to compensate must be done over the ClimateProjects system.

9: Compensation activities must be verified during every certification process.

Silvicultural systems — Silvicultural systems may change by shortening a forests rotation period, applying a different thinning regime, adding plantings in the understory etc.

D. Permanence

In order to ensure the permanence of CO_2-certificates, the project must have a long-term sustainable set-up. Amongst other factors, this depends on the capacities of the project workforces and the secured land tenure of the project area.

Since a small risk of project shortfall always exists, these are covered
- firstly by compensation activities (see chapter '10 Compensation Activities') and
- secondly, in case of a total project failure, by the CFS buffer (see chapter 'H - CFS Buffer')

11 Capacities Template

Management Capacity

1. Evidence must be given that the management staff has sufficient qualification and an appropriate structure to ensure the sustainable implementation and management of the project.

2. Evidence must be given that management staff decisions are taken by a joint process.

3. Evidence must be given that the management staff is working with an internal quality-control system.

4. Evidence must be given that the project works with other institutions to continuously expand the management staff's qualifications.

5. Evidence must be given, that suitable knowledge transfer within the management staff is ensured over time.

Financial Capacity

6. Evidence must be given by the cash-flow requirements of chapter 'A - 02 Additionality' that sufficient financial means are available to sustainably finance the project.

7. Evidence must be given on the financial health of project's financier - by providing:
   - financial reports from the past 3 years, OR
   - in case the project has not yet existed that long, by an official statement from a bank.

Bank The bank must be one of the S&P AA- up to AAA rated banks: www.StandardAndPoors.com Select 'Products & Services' > 'Financial Institutions' > 'Credit Rating List'

Technical Capacity

8. Evidence must be given that the project has sufficient technical capacities to ensure the sustainable implementation and management of the project.

   Therefore, a technical description of the following activities must be given:

   a. Nursery
   b. Land preparation (incl. lining out /spacing)
   c. Planting
   d. Beating up (replacing of dead seedlings)
   e. Maintenance
   f. Pruning
   g. Thinning
   h. Harvesting

Protective Capacity

9. Evidence must be given that risks which endanger the permanence of a project are mitigated.

   Therefore, an evaluation of the following risks must be given

   a. Water (drought, flood, hail, snow, heavy rains …)
   b. Wind (storms, hurricanes …)
   c. Animals (insects, domestic animals, wild animals …)
   d. Fire (human made, natural)
   e. Diseases (bacteria, viruses …)
   f. Temperature (coldness, heat)
   g. Encroachment of people
   h. Others

   A description must be given on how the project is protecting itself against the possible risks and which activities are implemented to mitigate them.

10. In case there is a risk of fire a 'Fire Management Plan' must be provided. This plan must include a description of the following activities:

    a. Fire awareness
    b. Fire prevention
    c. Fire equipment
    d. Fire detection
    e. Fire suppression
    f. Fire damage rehabilitation

D. Permanence

12 Land & CO_2 Tenure [Template]

1. Evidence must be given that the project area has a long-term secured land tenure.

2. Evidence must be given that permits which are necessary for the projects implementation and management (planting permits, harvesting permits, infrastructures permits, etc.) are secured over the long-term.

Note: The following criteria are also required in case of FSC certification

3. Evidence must be given that the project developer is also the
   a. Owner of the land (the project area) +
   b. Owner of the timber +
   c. Owner of other resources (within the project area)

   In case the project developer is not all of the above, written approval must be given that the respective owners agree with the foreseen project activity over the long-term.

4. In case the ownership of CO_2 from the project developer consists of multiple individuals, authorization for the administration and sale of the CO_2-certificates must be given to the project developer with a written approval.

Legal Notice

Disclaimer

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Furthermore, CarbonFix is not responsible for any actions or omissions by project stakeholders.

Further Information

For further details see the 'General Terms & Conditions' of the CarbonFix Standard or contact the CarbonFix secretariat under mail@carbonfix.info.