

Expected future challenges for LULUCF reporting: Natural disturbances and HWP

JRC technical workshop on reporting LULUCF

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Status

- **Natural disturbances (ND)** is a **voluntary provision**
 - However
 - **consistency** needs to be ensured in the treatment of natural disturbances in **FMRL** and in **accounted quantities**
 - **HWP** is a **mandatory carbon pool**
- Under certain conditions** is accounted for on the basis of **instantaneous oxidation**

Natural Disturbances

- Mapping natural disturbances in decision 2/CMP7
 - Para 1 a **Definition**
 - Para 12 & 14 **Consistency with treatment in FMRL**
 - Para 33 a **Accounting rules for FM**
 - Para 33 b **Accounting rules for AR**
 - Para 34 **Additional information**
 - Para 35 **Reporting**

ND - The rationale

- As a first order approximation IPCC applies the concept of managed land to separate anthropogenic and natural emissions from biological carbon pools
- However, emissions due to natural disturbances, e.g. drought, fires etc. occur also in managed land with high inter-annual variability
- Decision 2/CMP7 addresses on a statistical basis the impact of natural disturbances on the GHG balance of forest land (accounting);
- Annual emissions associated with ND that are outliers (95%CI) of the observed variability are treated as being generated by circumstances out of control, consequently emissions exceeding an observed background level are factored out from accounting.

Definition

- Natural disturbances excludes:
 - Harvesting
 - prescribed burning
- Natural disturbances are

Beyond the control of, not materially influenced by, a Party

- e.g. forest fires in consequence of a very dry season
- e.g. the Party has not dismantled its fire suppression system

Consistency with FMRL

Whether the Party decide to apply the ND provision:

- Emissions excludible are those from ND typologies included in the background level
- Methodological consistency in how emissions are estimated
- Background level included in the FMRL is the value to be used as a benchmark when calculating emissions to be excluded from accounting

Consistency with FMRL

Whether the Party decide not to apply the ND provision:

- Treatment of ND in the FMRL should be consistent with that applied when accounting.
- A Party that did include upper outliers in its FMRL has an expectation of credits.
- Is consistency ensured when in the FMRL are included outliers that do not occur in the CP?
- A Party that did exclude lower outliers in its FMRL has an expectation of credits.
- Is consistency ensured when in the FMRL are excluded lower outliers that do not occur in the CP?

Accounting for disturbances

- Decision 2/CMP7 requirements to access to the natural disturbance provision:
 - Setting a background level of emissions associated with annual natural disturbances that have been included in its reference level;
 - Avoiding the expectation of net credits or net debits during the commitment period, including through the use of a margin;
- Then a Party may
 - Exclude emissions from disturbances in years where those emissions are above the background level plus the margin, where a margin is needed, together with any subsequent removals during the CP;

Setting the background level

- Default approach provided by Decision 2/CMP7:
The average of a consistent and initially complete **time series containing 1990–2009** emissions associated with natural disturbances after the application of an iterative process to remove outliers, based on twice the standard deviation around the mean until no outliers can be identified.

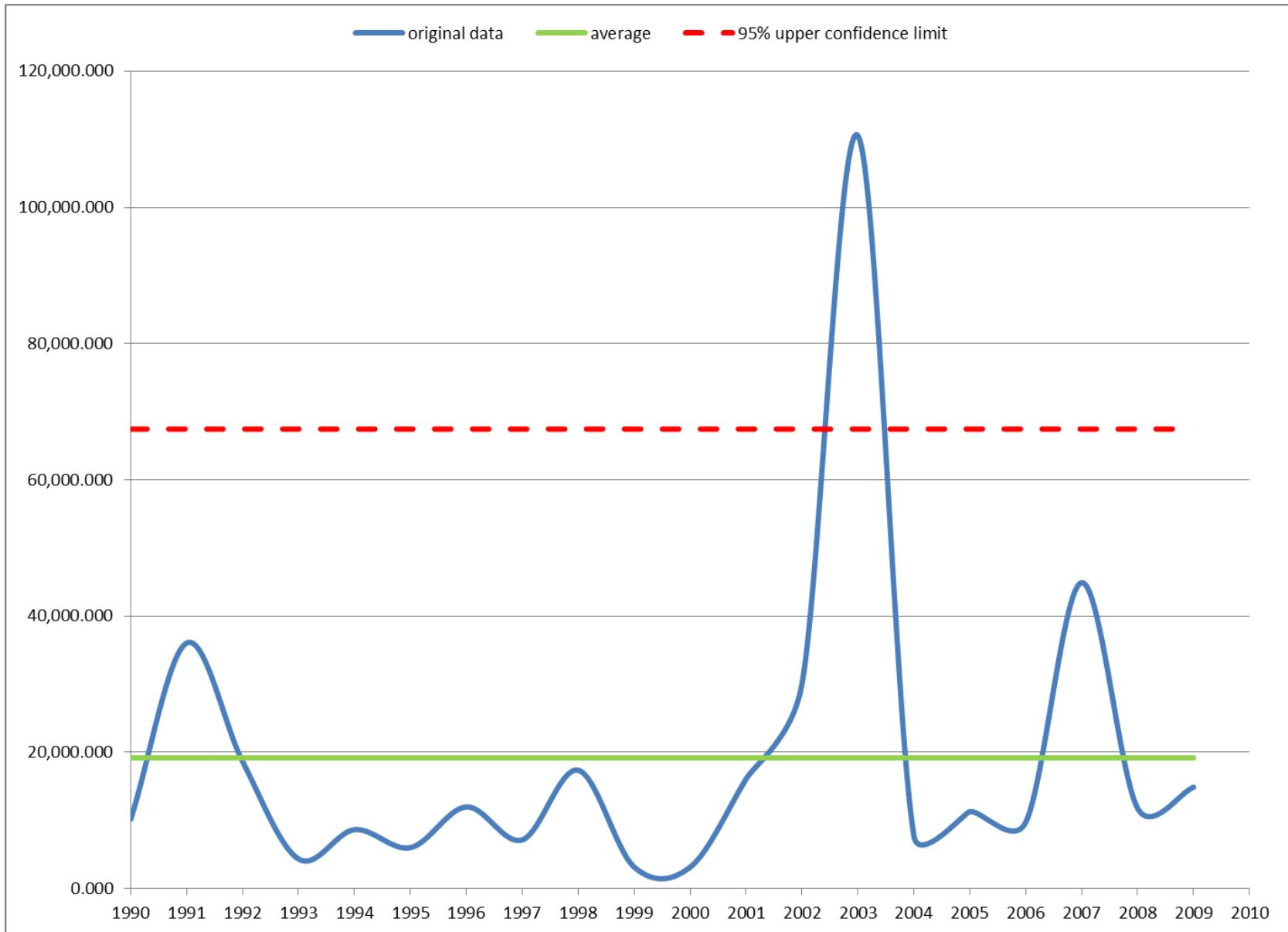
However, a Party may

apply a transparent and comparable country-specific approach using a consistent and initially complete time series of **data including for the period containing 1990–2009**.

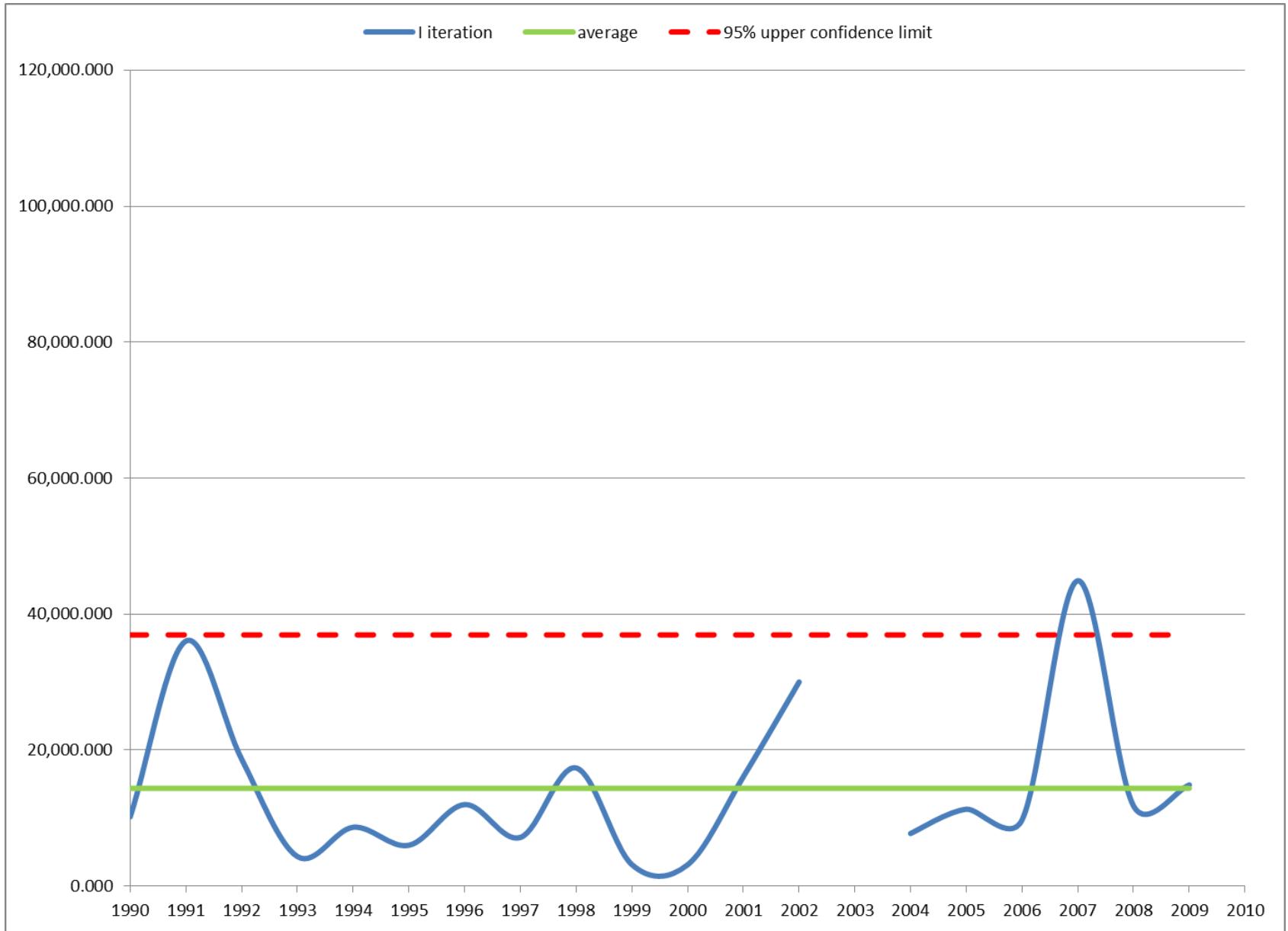
All approaches shall avoid the expectation of net credits during the commitment period.

If a Party's forest management reference level does not include a background level of emissions a value for the background level would be estimated by applying the first approach mentioned above. (AR)

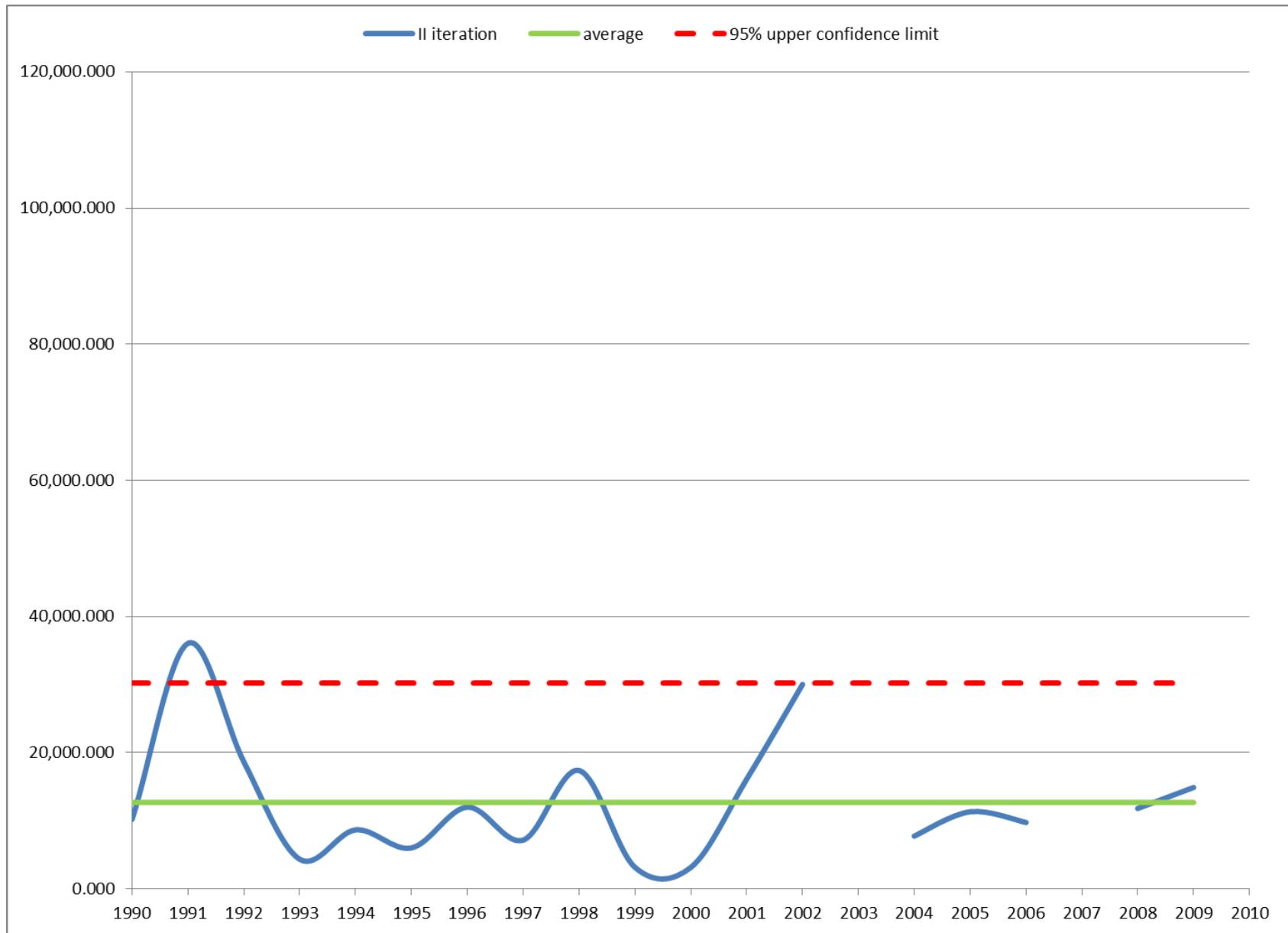
An example – original data



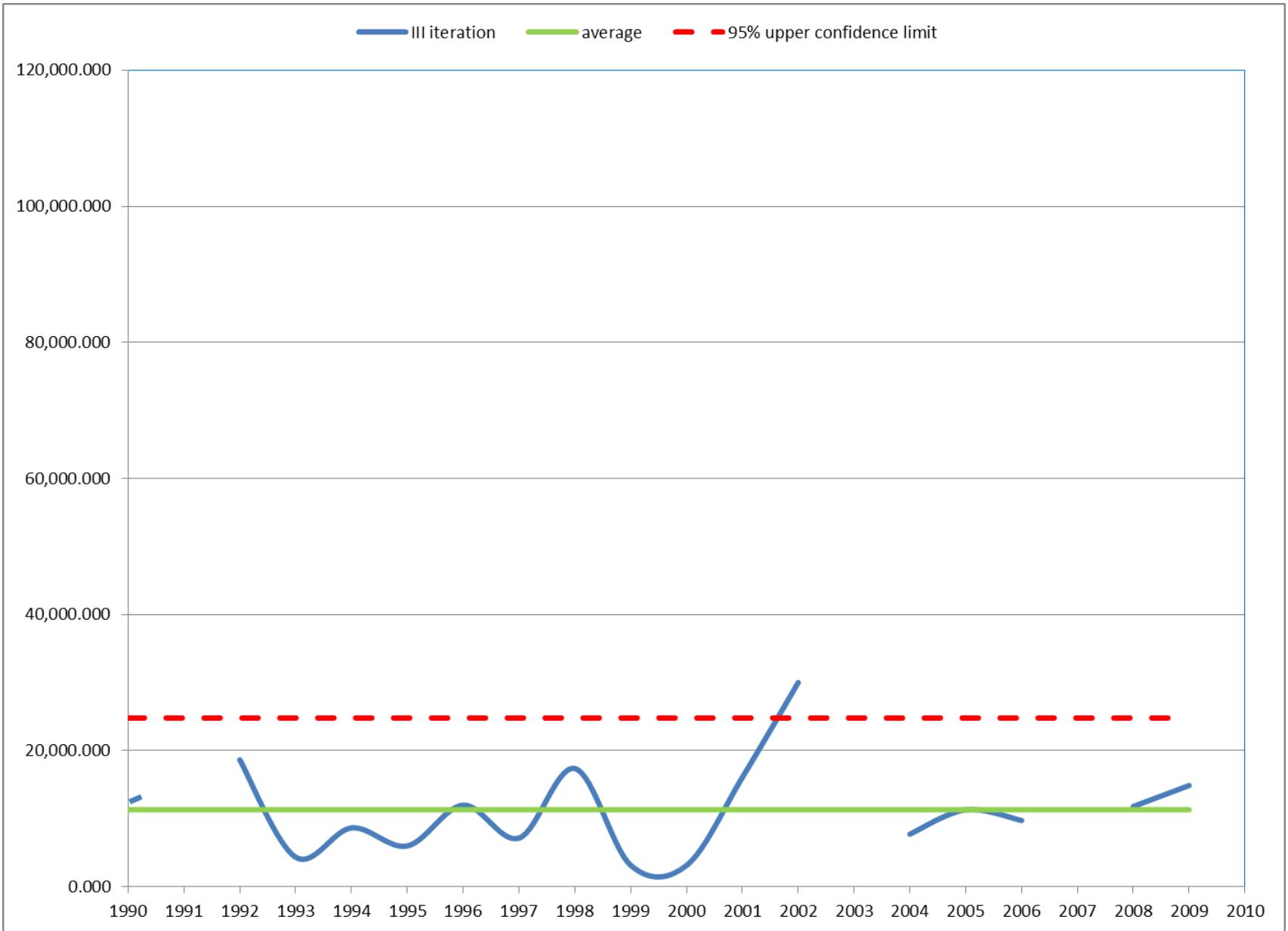
An example – I iteration



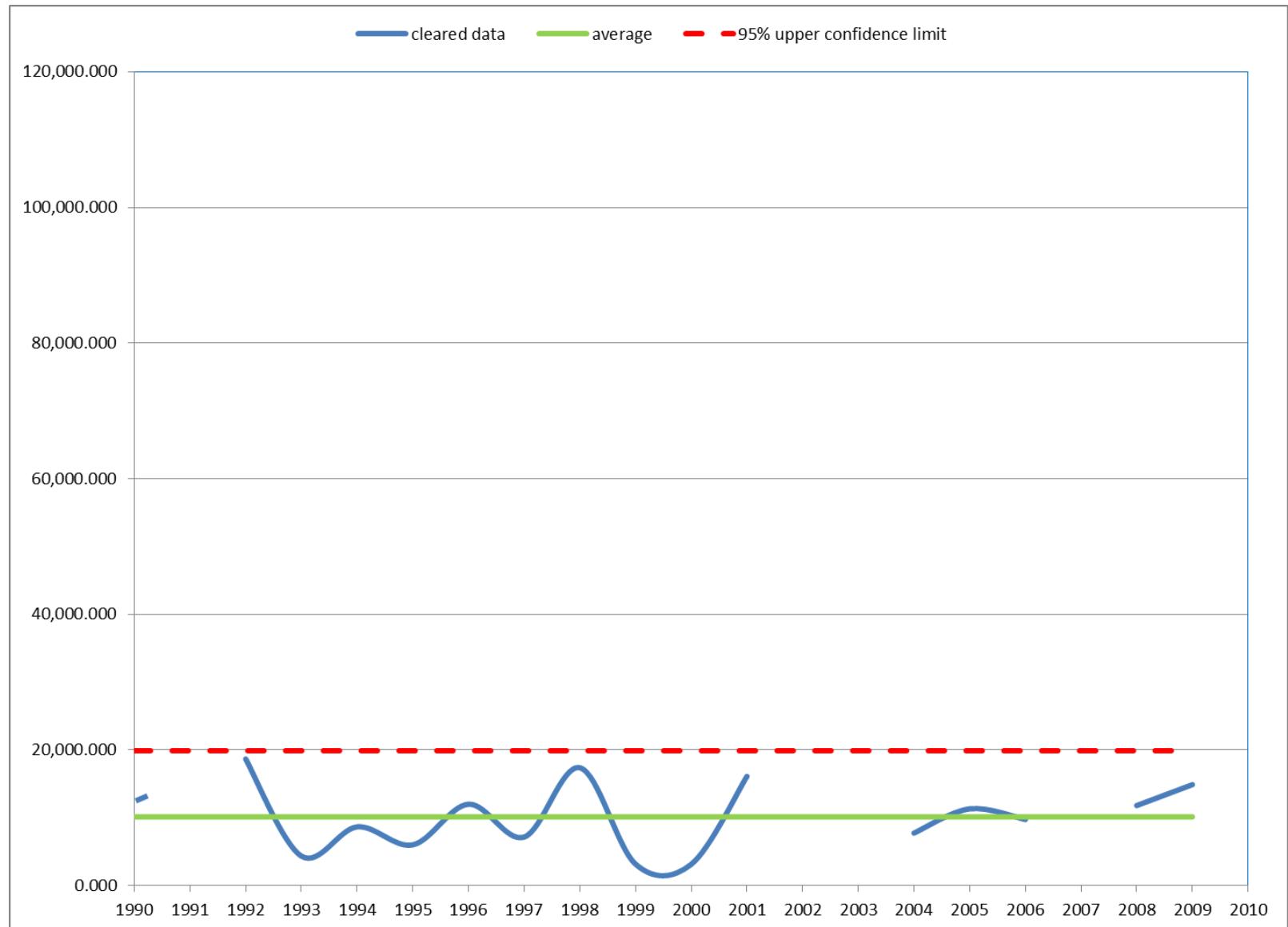
An example – II iteration



An example – III iteration



An example – Final cleared data



Green line is the background level

Red dotted line is the margin

Estimating a background level

The proposed default approach eliminates from the distribution of the sample (the 1990-2009 timeseries) all those values that, exceeding the average plus twice the standard deviation, are outliers - i.e. values that would have a weight in the calculation of the average level higher than their probability.

The “cleaned” distribution is assumed to be an unbiased representation of the expected level of emissions associated with natural disturbances, when disturbances are under-control of/counteracted by management activities.

The average value of the cleaned distribution is the background level that should be included in the reference level, where the reference level contains emissions from natural disturbances.

Setting a margin

- In the case that the background level is defined using the default approach, the margin would equal twice the standard deviation of the time series that determined the background level.

i.e. the margin is the upper boundary of the probability distribution associated with the background level, the probability distribution that determines whether an annual level of disturbances has been beyond control (i.e. has been an outlier)

- In the case that the background level is defined using a country-specific approach or the Party's reference level is zero, the Party must describe how a margin is established, where a margin is needed.

Making background level and margin working

All approaches shall avoid the expectation of net credits during the commitment period i.e. the total quantity of emissions associated with natural disturbances accounted for during the commitment period is expected equal or higher than the quantity of emissions associated with natural disturbances included in the reference level

The margin, where needed, is aimed at excluding values of emissions associated with natural disturbances which are outside the (upper boundary of the) probability distribution associated with the background level

During the commitment period, replacing outlier with the background level (e.g. the mean value of the distribution) is aimed at avoiding that no credits or debits are accounted for as consequence of natural disturbances.

Issues

Setting the background level at 0

This implies that all emissions and subsequent removals be excluded from accounting

and Excluding land from accounting

This implies that all removals from lands be excluded from accounting!

e.g. including tree-mortality in the BL -> having a severe drought all over the country (e.g. USA 2012) -> zeroing FM reporting!

Excluding from FMRL ND emissions (including tree mortality)

For consistency may imply to exclude ND emissions in accounting (including tree mortality) without excluding subsequent removals

Reporting for natural disturbances

- Background level of emissions associated with natural disturbances which have been included in the reference level; and how has been calculated
- Margin, where needed, to be applied in accounting to determine whether an annual level of emissions associated with natural disturbances during the CP should be replaced by the background level; and how has been calculated
- Subsequent removals during the CP on the lands affected, to be excluded from the accounting

Reporting for natural disturbances

- transparent information showing:
 - a. that all lands subject to paragraph 33(a) and (b) above are identified, including their georeferenced location, year and types of disturbances;
 - b. how annual emissions resulting from disturbances and the subsequent removals in those areas are estimated;
 - c. that no land-use change has occurred on lands for which the provisions are applied and explaining the methods and criteria for identifying any future land-use changes during the commitment period;
 - f. that emissions associated with salvage logging were not excluded from accounting

Reporting for natural disturbances

- transparent information that demonstrates:
- d. that the occurrences were beyond the control of, and not materially influenced by, the Party in the commitment period, by demonstrating practicable efforts to prevent, manage or control the occurrences that led to the application of the provisions;
- e. efforts taken to rehabilitate, where practicable, the land for which the provisions are applied;

FM and AR

- Emissions associated with annual natural disturbances can be factored out in accounting for FM and AR.
- The afforestation and reforestation background level of emissions associated with annual natural disturbances and a margin, where a margin is needed, have to be calculated using a methodology consistent with the one used by the Party to calculate the forest management background level.

Additional reporting requirement for ND

- **On Land representation:**
 - need to know whether a deforested land was subject within the CP, to natural disturbances whose associated emissions have been excluded from accounting; and
- **On Carbon stock losses:**
 - having to know whether the carbon-stock losses accounted for in the disturbed lands, in the year for which the provision on natural disturbances is applied, include the losses due to logging (An issue for stock difference method).

Additional reporting requirement for ND

- On land representation:
 - Further stratification of forest lands:
 - lands subject to forest management that did not experience a natural disturbance whose associated emissions have been excluded from accounting in the CP,
 - lands subject to forest management that did experience a natural disturbance whose associated emissions have been excluded from accounting in the CP,
 - afforested/reforested lands that did not experience a natural disturbance whose associated emissions have been excluded from accounting in the CP,
 - afforested/reforested lands that did experience a natural disturbance whose associated emissions have been excluded from accounting in the CP.

Additional reporting requirement ND

- On land representation:
 - For countries for which forest management does not cover the whole forest surface, land representation needs to distinguish between disturbances occurred in forest lands subject to FM and disturbances occurring in forest lands excluded from FM

Additional reporting requirement ND

- On land representation:
 - Or statistical analysis of occurrences on lands:

Table 1 Statistical analysis of a timeseries of data related to the fate of carbon stocks and land-use in forest lands that have been subject to natural disturbances.

Time	Forest cover vectors						
	V1	V2	V3	V4	V5	V6	V7
1	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover
2	Undisturbed forest cover	forest cover loss by windfall	Forest cover loss by logging	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover	Undisturbed forest cover
3	Undisturbed forest cover	Forest cover removal by salvage logging	Forest regeneration	Undisturbed forest cover	forest cover loss by fire	Undisturbed forest cover	Undisturbed forest cover
4	Undisturbed forest cover	Forest regeneration	Forest regeneration	Undisturbed forest cover	Grassland	Forest cover loss by wildfire, and associated emissions within the background level	Forest cover loss by wildfire, and associated emissions larger than the background level plus the margin
5	Undisturbed forest cover	Forest regeneration	Forest regeneration	Forest cover loss by logging	Cropland	Forest regeneration	Forest regeneration
6	Undisturbed forest cover	Forest regeneration	Forest regeneration	Settlements	Grassland	Forest regeneration	Forest regeneration
Area (%)	60	10	10	5	5	5	5

Additional reporting requirement for ND

- On carbon stocks:
 - With stock difference method:
 - To separate the contribution of different causes
 - To separate removals from emissions
 - To separate and track lagged emissions caused during the CP as a consequence of ND

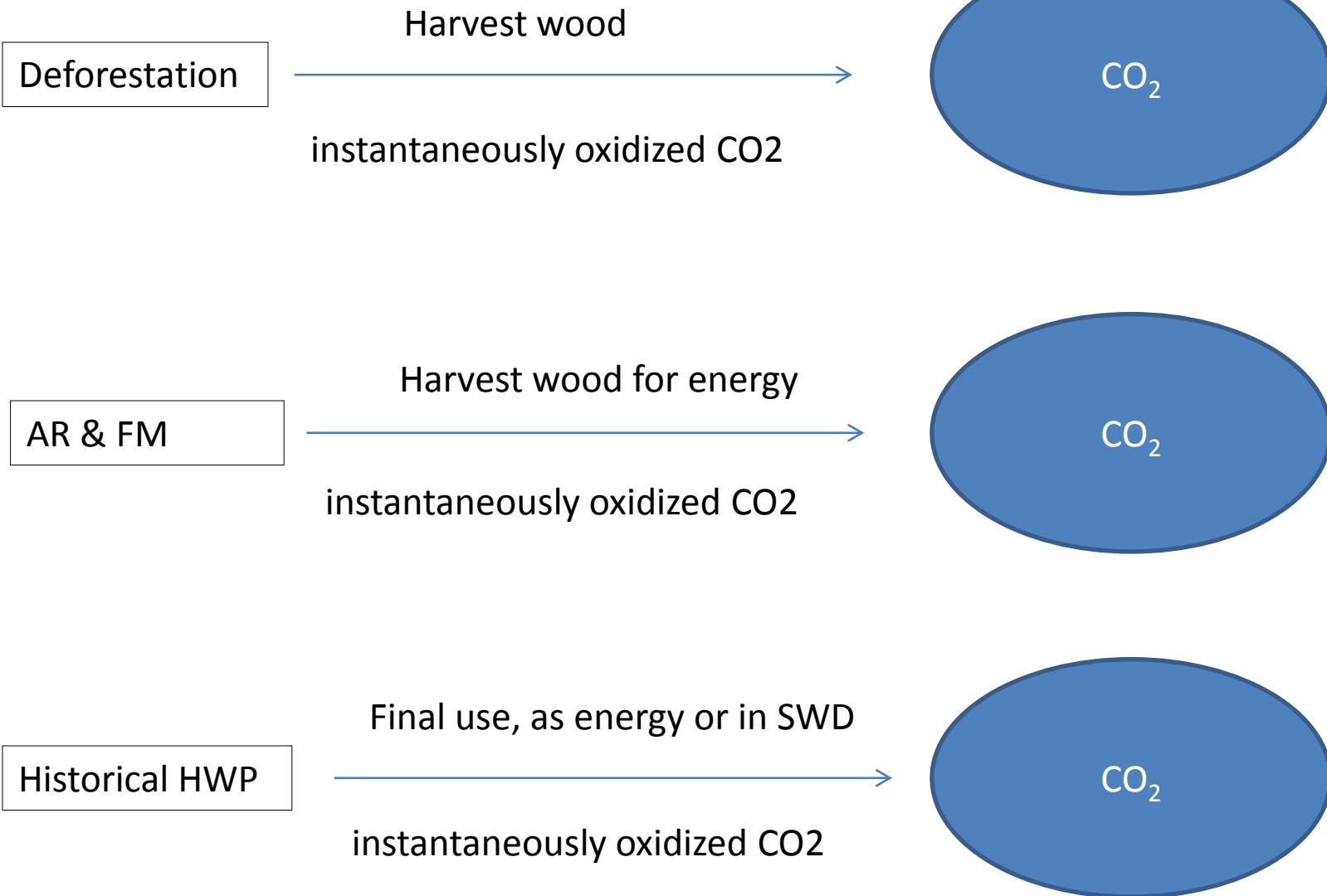
HWP

- Mapping HWP in decision 2/CMP7
 - Para 12 & 14 **Consistency with treatment in FMRL**
 - Para 16 **Accounting rules for historical HWP**
 - Para 26 **Mandatory Accounting, could be on the basis of instantaneous oxidation**
 - Para 27 **Exclusion of imported HWP**
 - Para 29 **Production approach, stock change with default first-order decay function**

HWP

- Mapping HWP in decision 2/CMP7
 - Para 30 **Use of country specific methods and factors**
 - Para 31 **Deforestation accounted on the basis of instantaneous oxidation**
 - Para 32 **Waste and energy (end)use of HWP shall be on the basis of instantaneous oxidation**

HWP



HWP

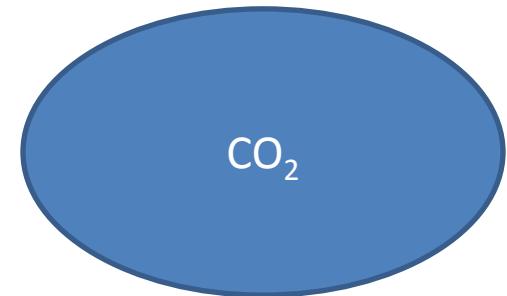
AR & FM & any
other 3.4 activity

Harvest wood for production

C stock changes

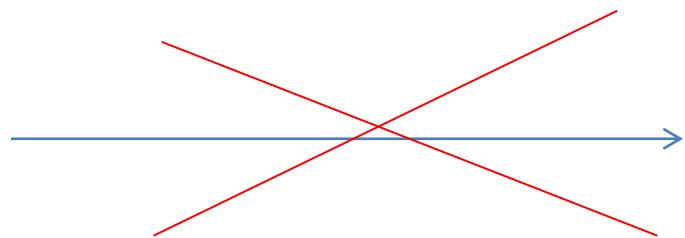
First order decay function

AR & FM (only for
FMRL not projected)
& any other 3.4
activity



Historical HWP from
deforestation

Excluded from accounting



HWP

Historical HWP
from AR

Excluded from accounting

Historical HWP
from
FM
and **other 3.4**
activities

~~if already accounted in the first CP
with a projected FMRL, can be~~

Excluded from accounting

First order decay function

C stock changes

Additional reporting requirement for ND

- HWP data are available for all countries (e.g. FAO)
- Apportion across different activities/lands of origin (e.g. managed forest lands not reported under KP) may be done:
 - proportionally to the harvesting quantities
 - Tracking the land of origin of HWP (not for historical data)
- Whether apportion is not possible, the inclusion within FMRL of HWP produced non in lands under FM, is conservative, as far as double counting avoided