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Methods and approach to account for harvested wood products (hwp)

Informal expert group under the European Climate Change Programme

"Climate policy for land use, land use change and forestry“

23 June 2010, Beaulieu Bruxelles

Definitions

- Estimating = process of calculating emissions and/or removals of greenhouse gases. Estimation can be undertaken by various different techniques, including modeling, measurement, monitoring and default values, or a combination of these.
- Method = calculation framework within an approach for estimating emissions and removals (= net-emissions / increase or decrease of carbon pool)
- Approach = conceptual framework for estimating emissions and removals of greenhouse gases. The approach refers to the system boundary, defining which emissions and removals are to be reported or accounted by each Party.
- Accounting = The rules for comparing emissions and removals, as reported, with commitments assumed by Annex I Parties. Accounting means calculating 'debits' and 'credits' with reference to an agreed emission reduction target.

(cf. *inter alia* Cowie et al, Climate Policy 6 (2006) 161-179)

- **Methods for estimating net-emissions**
- **Accounting approach for HWP**
- **Projections of net-emissions from HWP**
- **Summary**

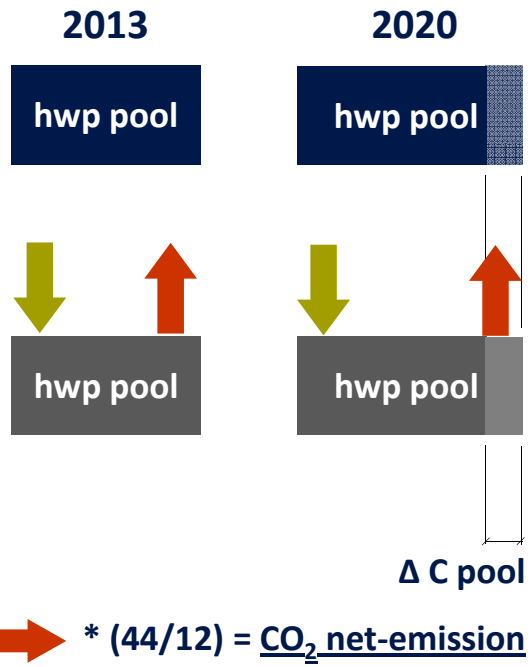
Methods for estimating net-emissions from hwp pool

- **Inventories**
  - e.g. building statistics

- **Flow data**

  Inflow
  - Direct estimation
  - Data on production and trade of wood products (commodity data)*
  - Data on roundwood removals

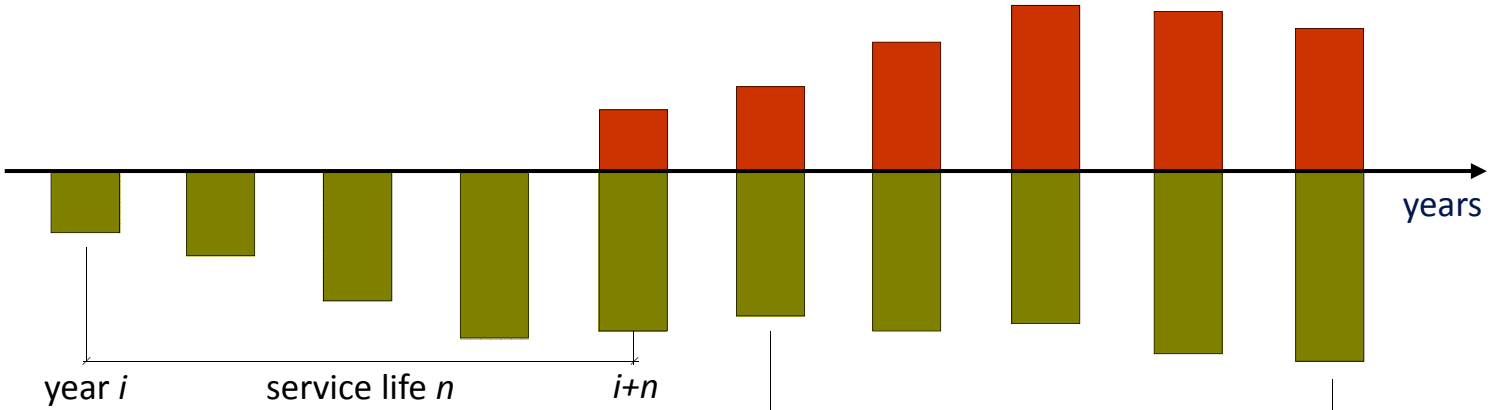
  Outflow
  - Direct estimation
  - Estimation using service life data
    - Linear decay
    - Logistic decay
    - Exponential decay*



→ * (44/12) = CO_2 net-emission

** IPCC 2006 GL tier 1 method*

Estimating carbon flows using service life data

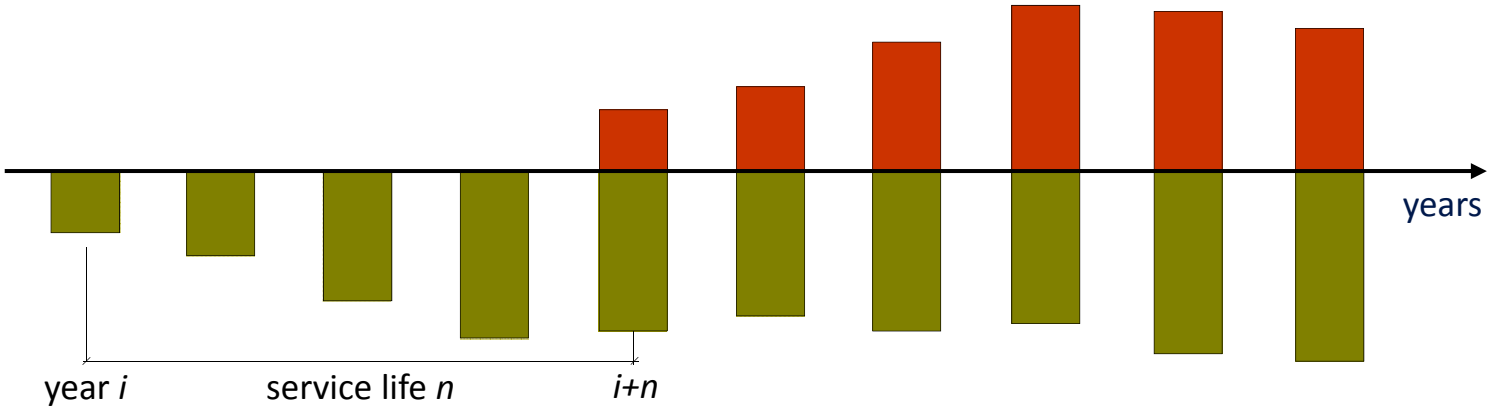


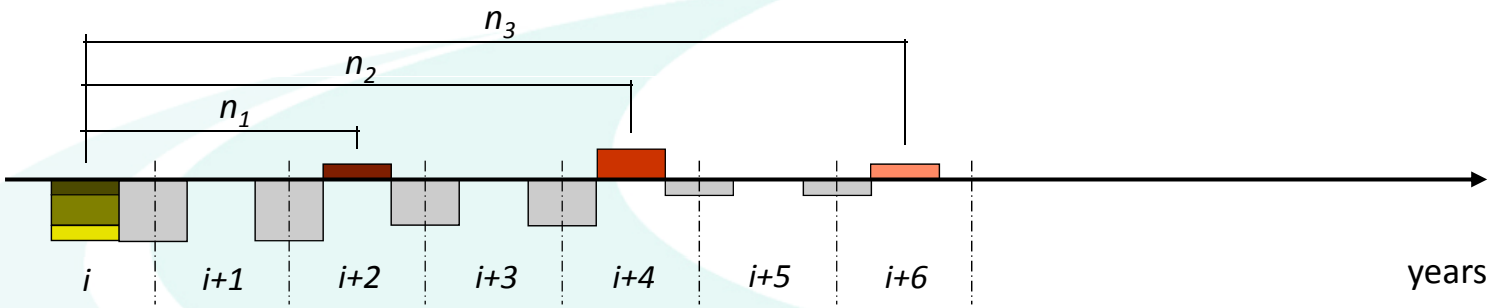
Annual pool change for estimating net-emissions (***here***: **Inflow – Outflow**)

Inflow of carbon to the pool

Outflow of carbon from the pool

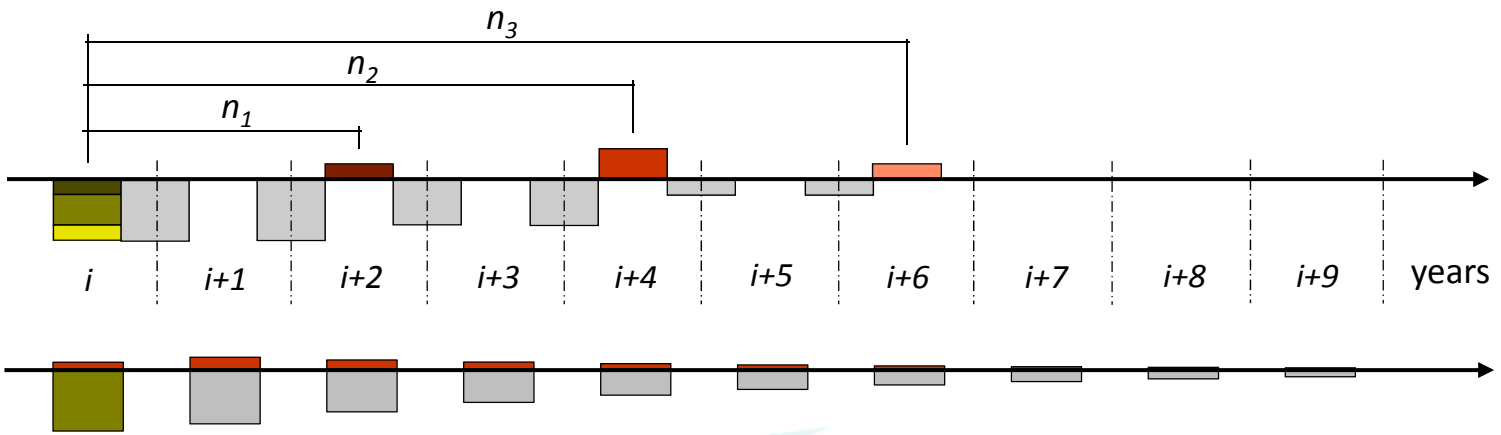
Estimating carbon flows using service life data





$n_1 = 2$ (25%)	$n_2 = 4$ (50%)	$n_3 = 6$ (25%)	service lifetime
			Inflow of carbon to the pool
			Outflow of carbon from the pool

IPCC 2006 tier 1 method

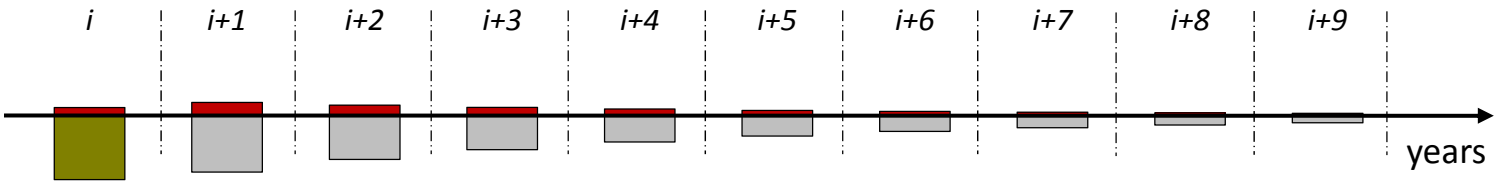


- **Estimating annual net-emissions using exponential decay function[1] better reflects diversity of service life estimates of wood products in numerous application areas**
- **Combination with data on semi-finished wood products (production and trade of sawnwood, panels and paper products) reflect cuttings along processing chain**

n_1 = 2 (25%)	n_2 = 4 (50%)	n_3 = 6 (25%)	service lifetime
			Inflow of carbon to the pool
			Outflow of carbon from the pool

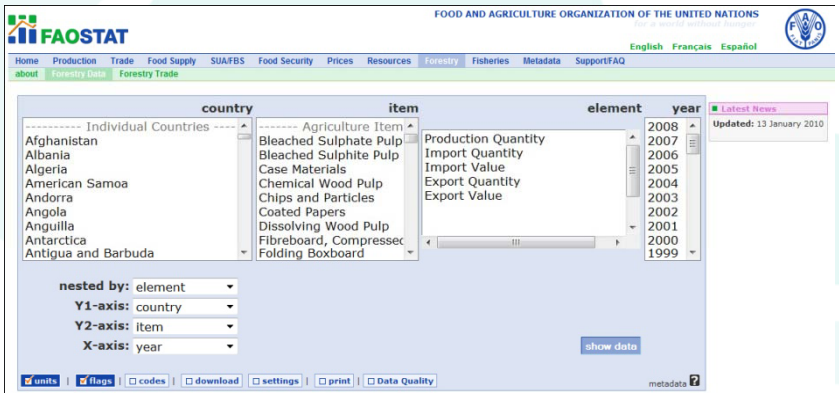
[1]) cf. IPCC 2006 GL tier 1 (Equation 12.1.A, Pingoud and Wagner, 2006)

IPCC 2006 tier 1 method



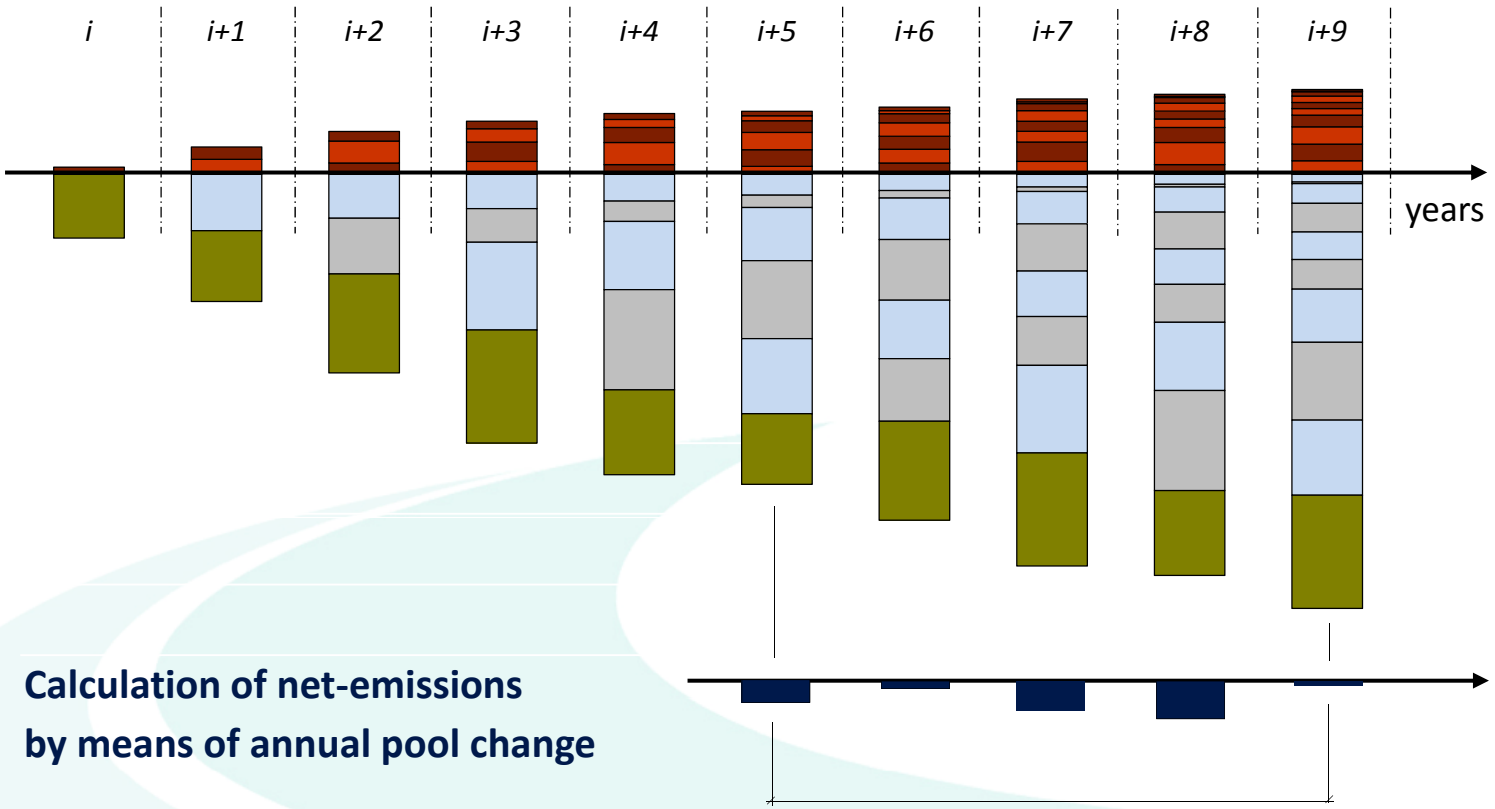
What is considered to be the Inflow to the pool?

- **Activity data on production and trade of semi-finished wood products provided by international databases, e.g. FAO/ECE (submitted by countries, thus country-specific)**
  - **available on annual basis for all countries worldwide**
  - **transparent and comparable data (no double counting)**



- **Inflow = outflow**
- **Method conforms to good practice to neither over-estimate the removals (inflow) nor underestimate the emissions (outflow)**

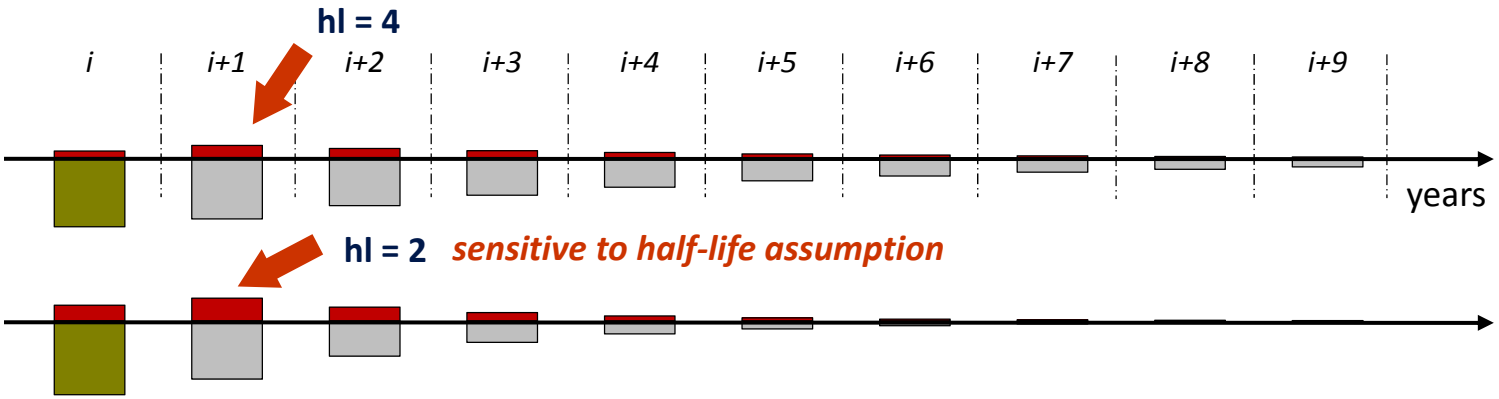
IPCC 2006 tier 1 method



- **Calculation of net-emissions by means of annual pool change**

- Inflow of carbon to the pool
- Outflow of carbon from the pool
- Carbon pool

Service life data



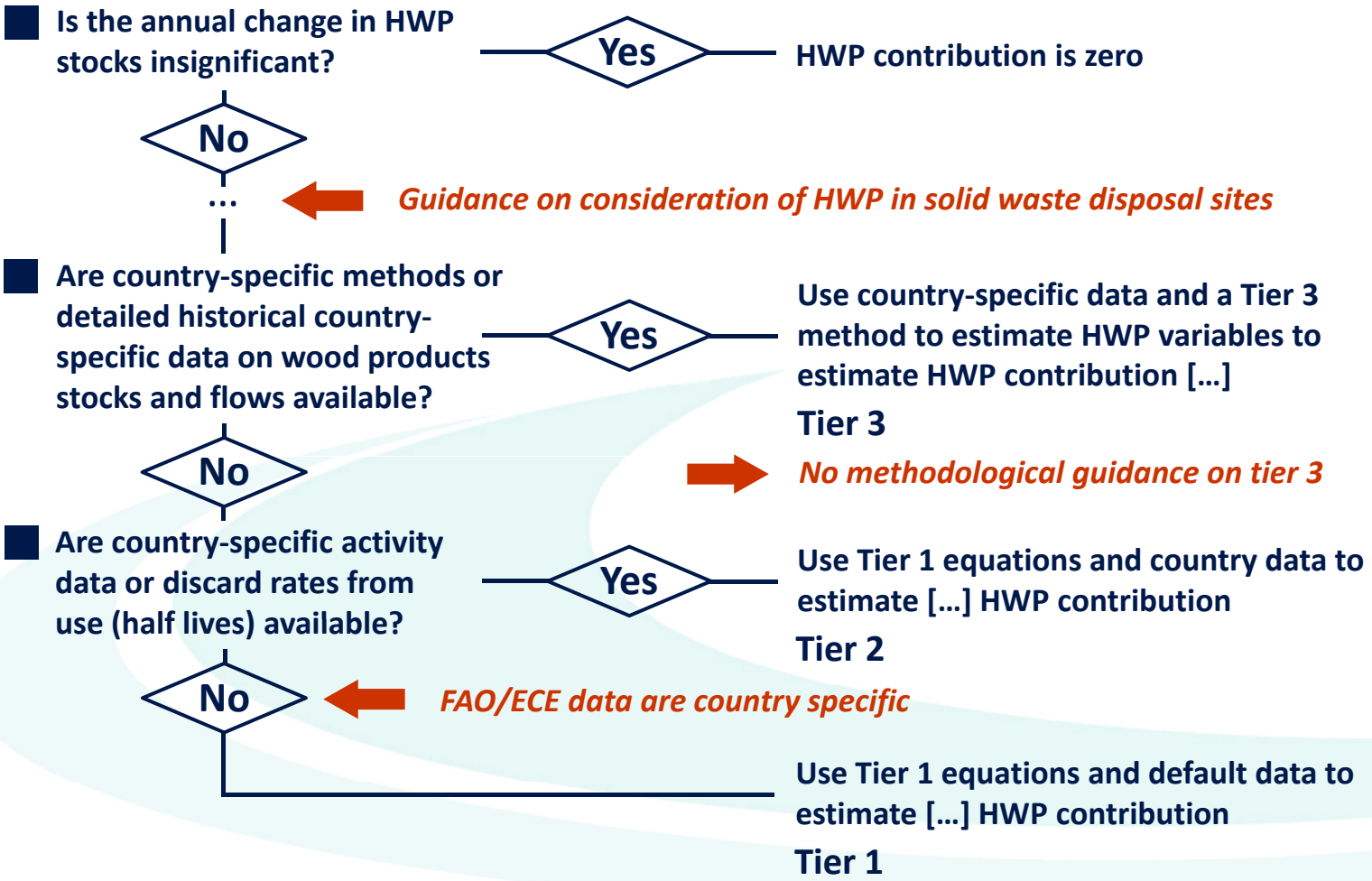
IPCC 2006 tier 1 defaults	half-life	service-life
▪ Solid wood products (sawnwood, wood based panels)	30 yrs	43 yrs
▪ Paper products (paper and paperboard)	2 yrs	3 yrs

Service life (half-life) is country-specific (market distribution, etc.)

Example: Germany (combination of info on use of wood in market segments and spec. service life data)		
▪ Sawnwood coniferous	30,5 yrs	44 yrs
▪ Particle board	15 yrs	22 yrs
▪ Oriented strand board	38 yrs	55 yrs
Mass weighted average	*24 yrs*	*34 yrs*

(Rüter, 2009)

IPCC 2006 Guidelines – decision tree for selecting a tier



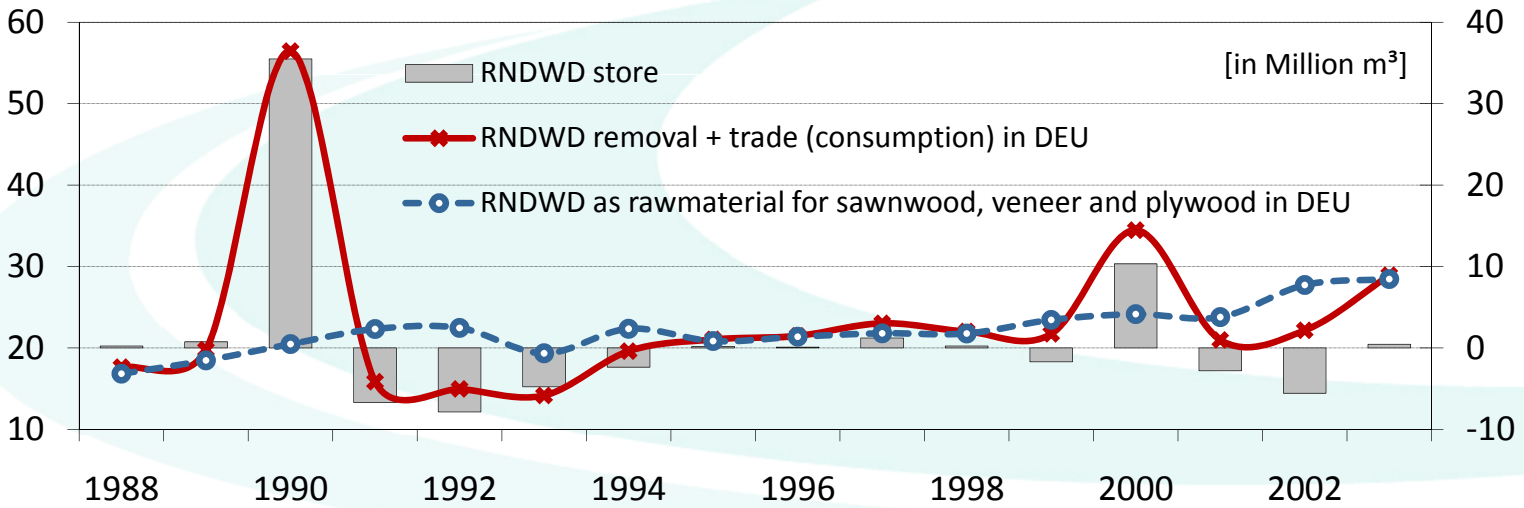
Inventory method

- Detailed data for use of wood e.g. in wooden buildings available only in Finland

(cf. Pingoud et al, 2001)

Inflow data for hwp pool based on roundwood removals

- No correlation of wood products production and subsequent consumption (i.e. sawnwood, veneer sheets and plywood) with available amounts of roundwood being used as raw material (roundwood consumption) on national level



- Methods for estimating net-emissions
- Accounting approach for HWP
- Projections of net-emissions from HWP
- Summary

Objective of including hwp

- Inclusion of HWP pool better reflects the timing of emissions (what atmosphere sees)
- HWP accounting offers opportunity to incentivize substitution of more energy intensive materials

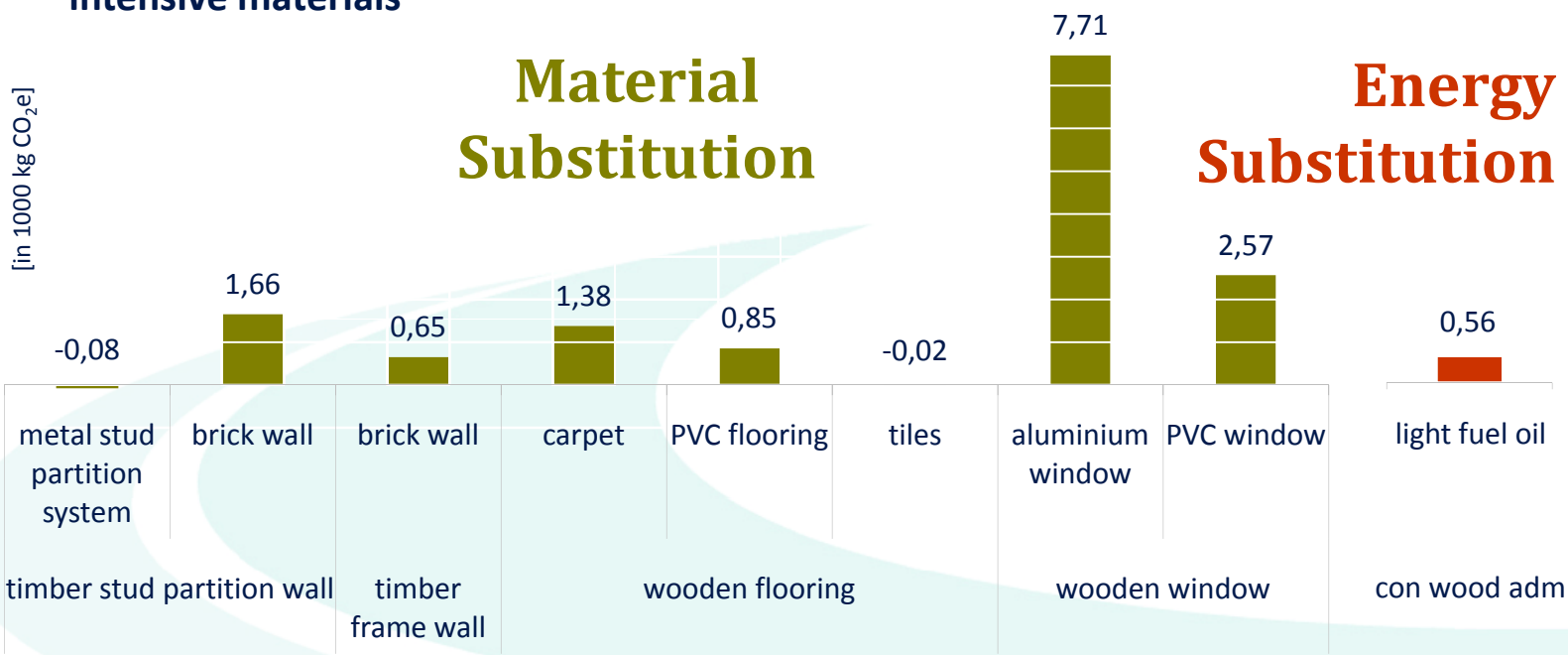
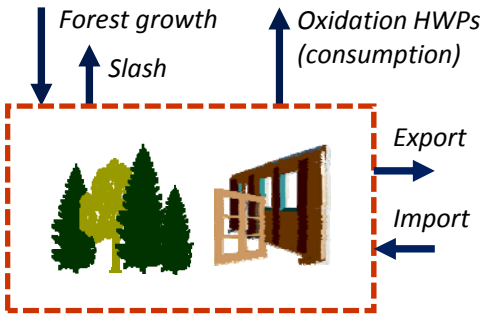


Fig 13-1: Material and energy substitution potential of 1m³ timber as compared to their substitutes (GWP 100)* (Rüter, 2010 and Albrecht et al., 2008)

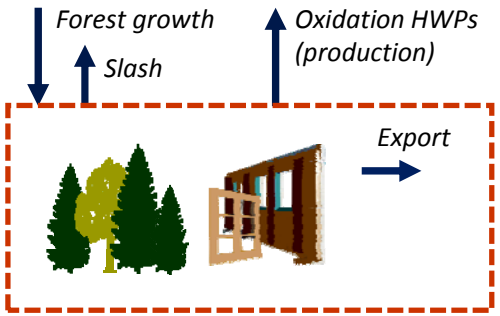
* calculated and reviewed acc. to ISO 14040 ff. (life cycle assessment)

Different accounting approaches in the past

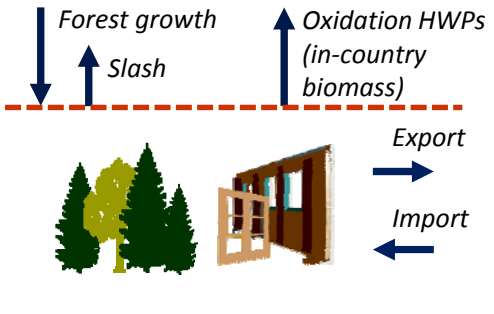
Stock-change approach

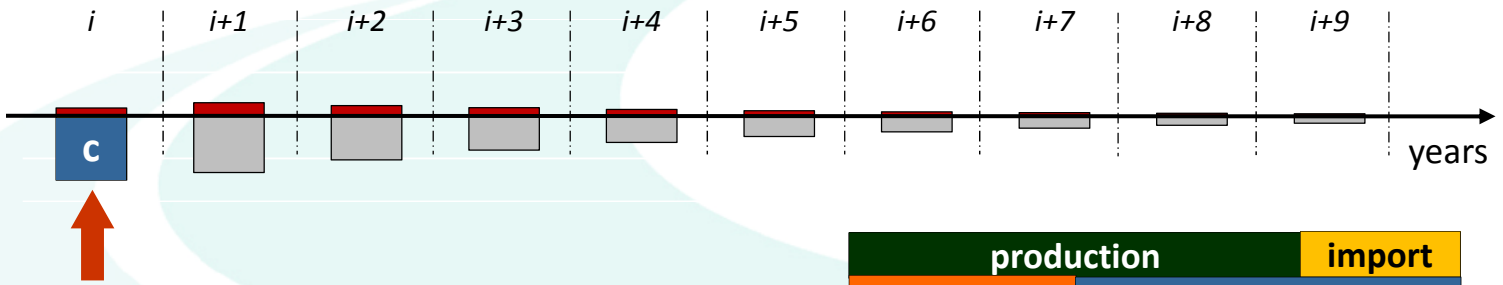


Production approach



Atmospheric flow app.





Consumption = Production + Import - Export

Common EU proposal since 07/2009; meanwhile common Annex I proposal*

* FCCC/KP/AWG/2010/6/Add.2

[Option 2:

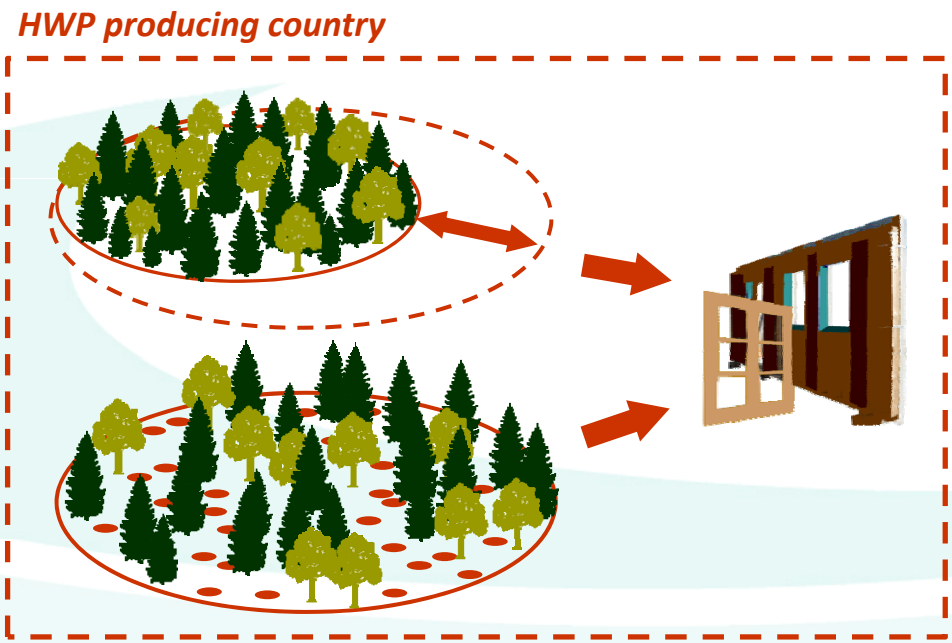
21 ter. Emissions from carbon in wood removed from forests accounted for under Article 3 shall be accounted for by the producing country, as a default, on the basis of instantaneous oxidation, or on the basis of estimates of when emissions occur, provided that verifiable and transparent data are available. Accounting[1)] shall be confined to harvested wood products[2)] originating from harvested forest for which emissions and removals have been included in the accounting of the Party. ...]

Since 1990

- Afforestation
- Reforestation
- Deforestation

In commitment period

- Forest management



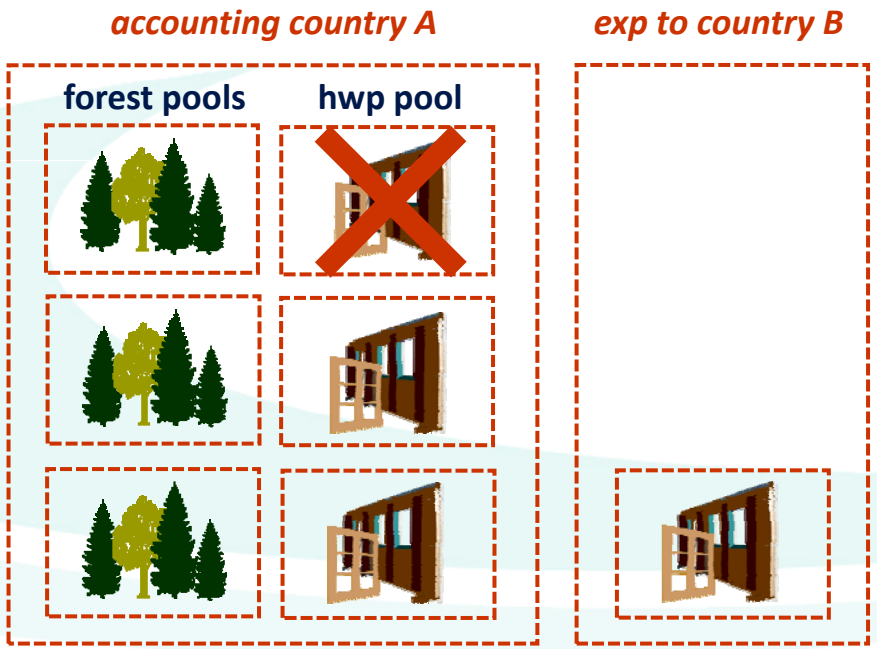
[Option 2:

21 quinquies. Accounting may be on the basis of when emissions occur for the domestically produced and consumed harvested wood products pool only, and may also be on the basis of when emission occur for the exported harvested wood products pool.

21 sexies. Estimates of net emissions from harvested wood products shall specify product categories and the underlying assumptions used for both domestic and export markets. ...]

3 step approach

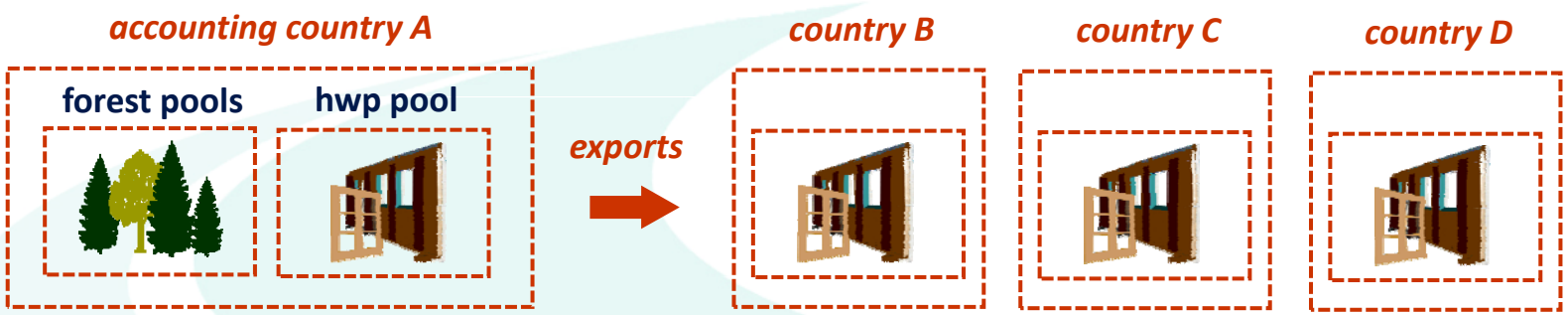
- **Inst. oxidation**
- **Domestically produced and consumed only (excluding exports)**
- **Domestically produced (including exports)**



[Option 2:

21 septies. When a Party accounts for exported harvested wood products on the basis of when emissions occur, estimates shall be reported separately for each country to which the harvested wood products are exported, using nationally specific data on the fate of the wood in the importing country.

21 octies. Emissions from harvested wood products in solid waste disposal sites shall be accounted for on the basis of instantaneous oxidation. ...]

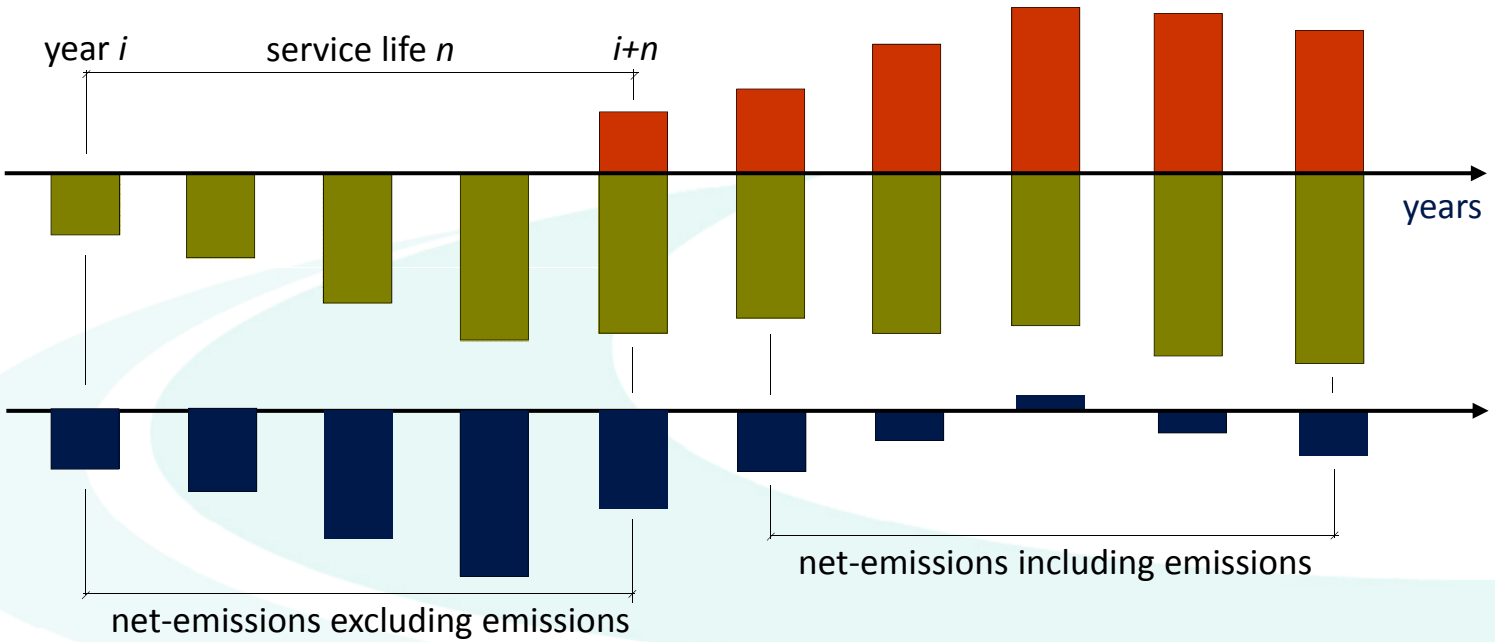


Country-specific assumptions e.g. on:

Half-life:	**30**	**28**	**22**	**34**

[Option 2:

[21 novies. Emissions that occur during the commitment period[3)] from the harvested wood pool arising from wood harvested by the Party prior to 31 Dec 2007 [and since 1990] shall also be accounted for, using the same procedure as above and in line with the latest IPCC guidance, approved by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol]. ...]



Excluding the existing pool and emissions thereof would tremendously increase net-emissions (potential credits)

- Methods for estimating net-emissions
- Accounting approach for HWP
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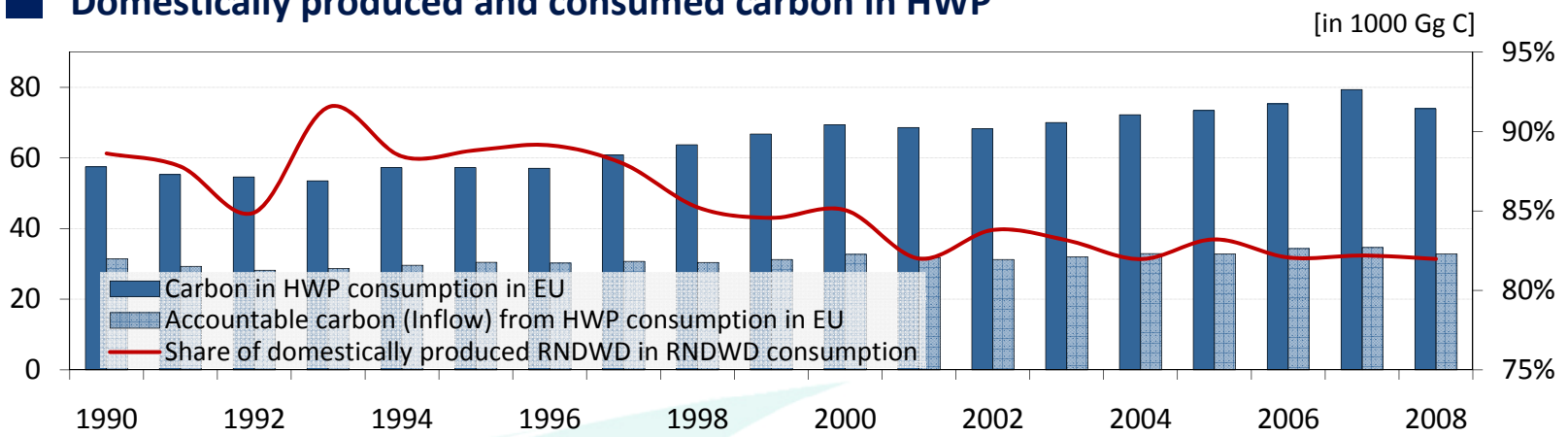
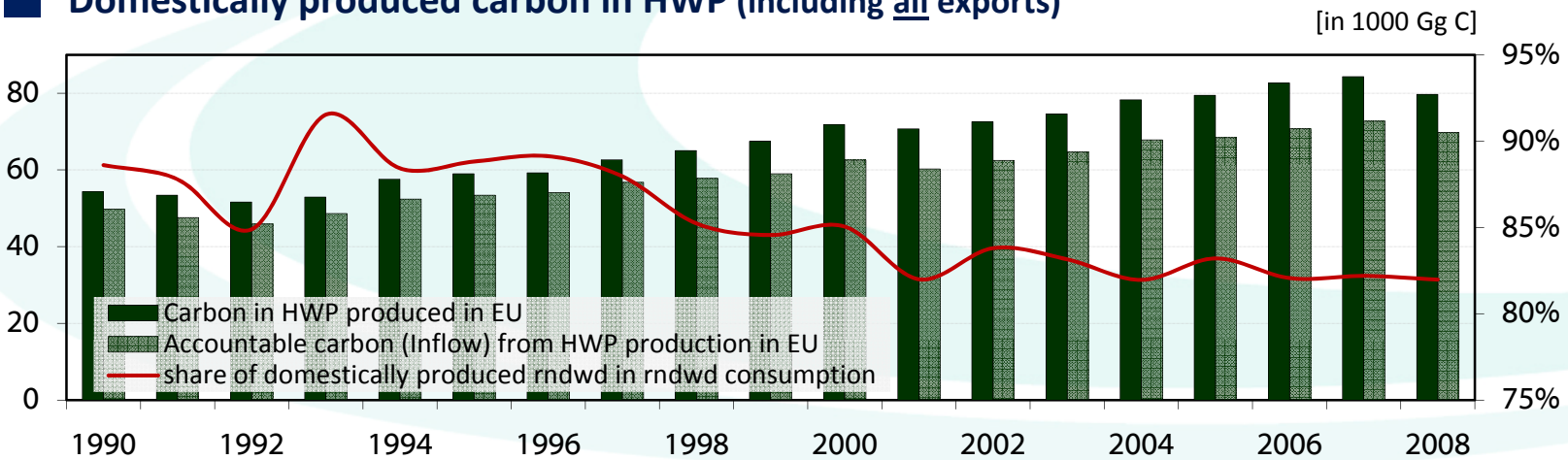
- Summary

Calculation of carbon amounts to be considered

Domestically produced and consumed carbon in HWP



Domestically produced carbon in HWP (including all exports)



Estimating HWP contribution to LULUCF using projections

The projection assumes stable Inflow of HWP to the pool until 2020.

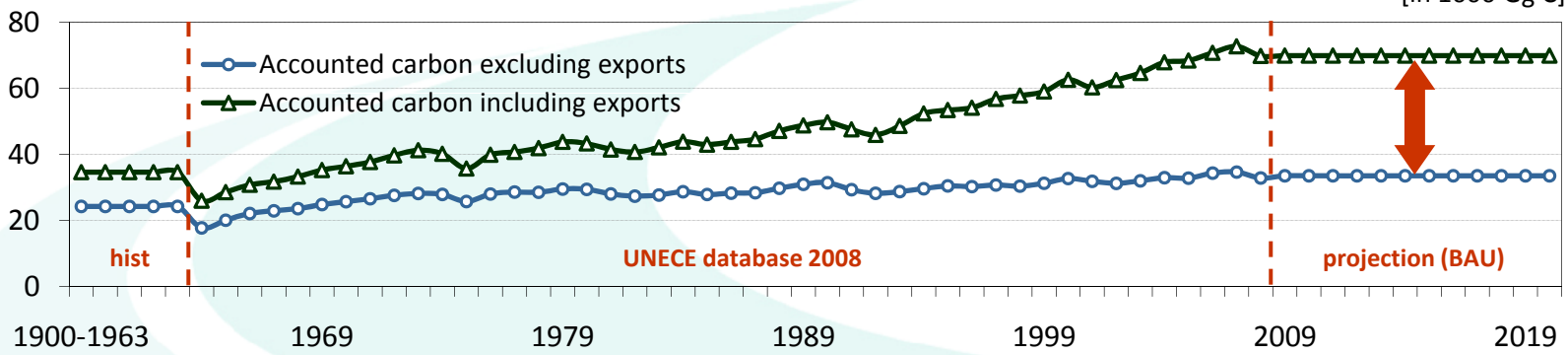
a) excluding and b) including exports

NOTE: To simplify matters, the contribution of exported HWP to Parties' net-emissions is aggregated including all exported HWP of the respective commodities and is calculated by means of the same underlying assumptions as domestically produced and consumed HWP.

Projection A

- BAU: constant Inflow until 2020 (growth = 0,00%) based on average of last 5 years of Inflow, starting from 2009 (calculated separately for each member state beforehand)

[in 1000 Gg C]



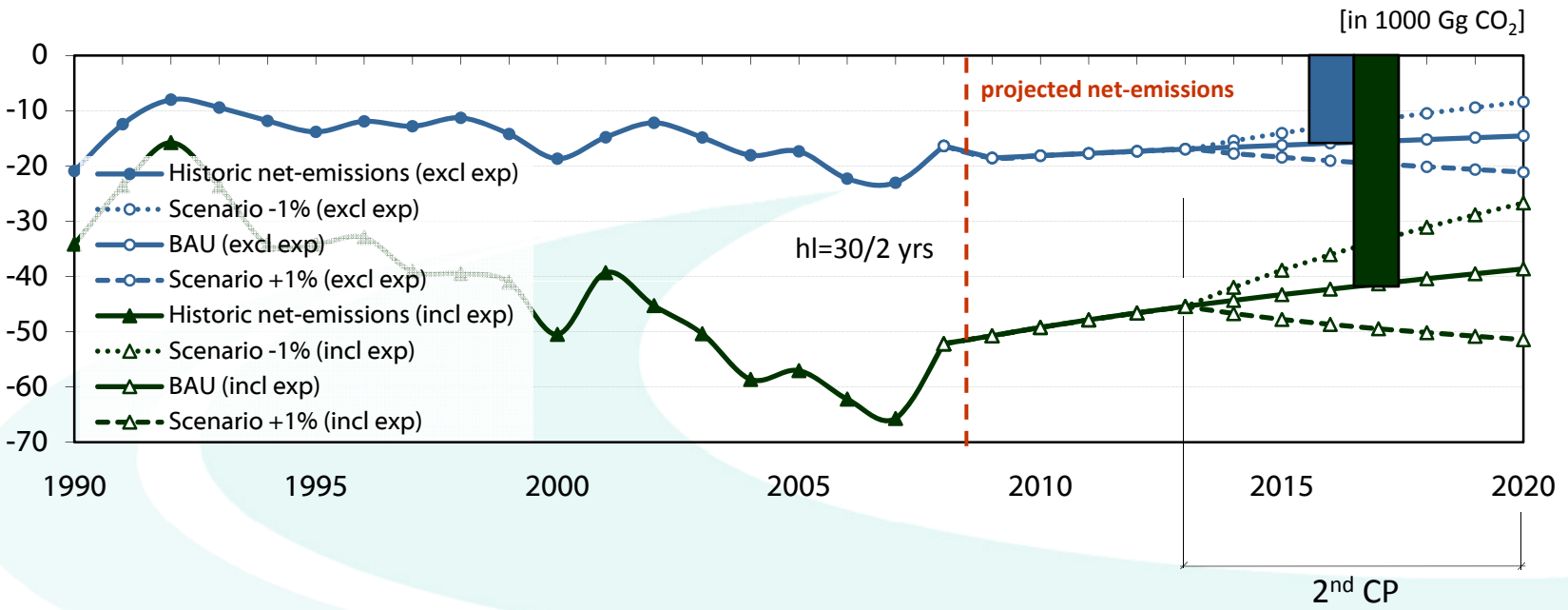
Projection B

- based on the long term trend for increase/decrease of pool Inflow over the period of 1990 – 2008
- BAU: constant country specific average annual gradient of change of Inflow b (trend), based on average of last 5 years of Inflow, starting from 2009

Calculating future net-emissions from carbon inflow scenarios

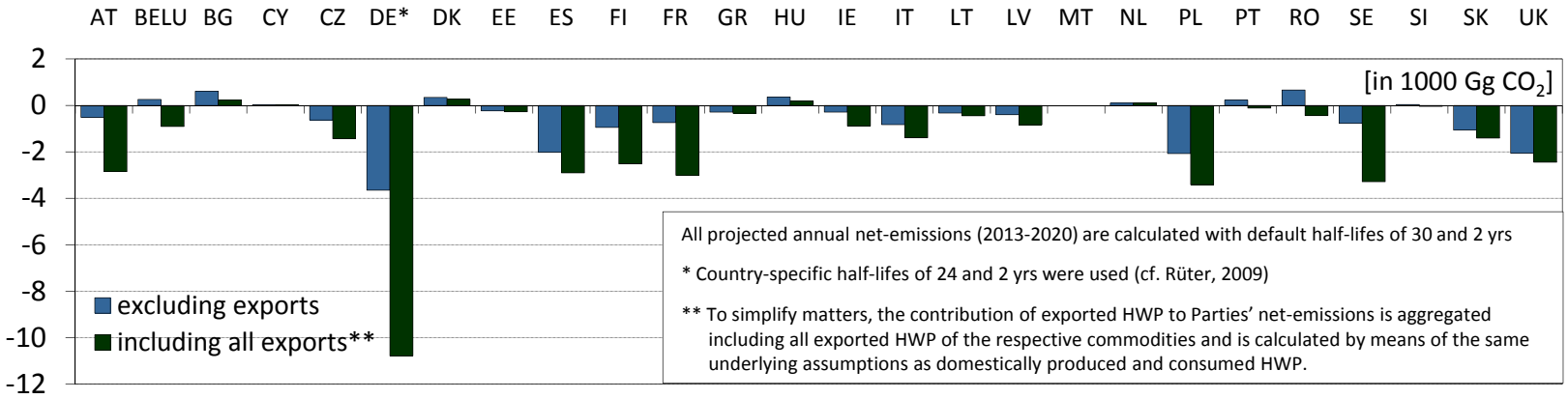
Projection A: BAU and scenarios of annual net-emissions [in 1000 Gg CO_2]

- Scenario 1 (2013-2020) with annual growth of Inflow = -1,00 %
- Scenario 2 (2013-2020) with annual growth of Inflow = +1,00 %

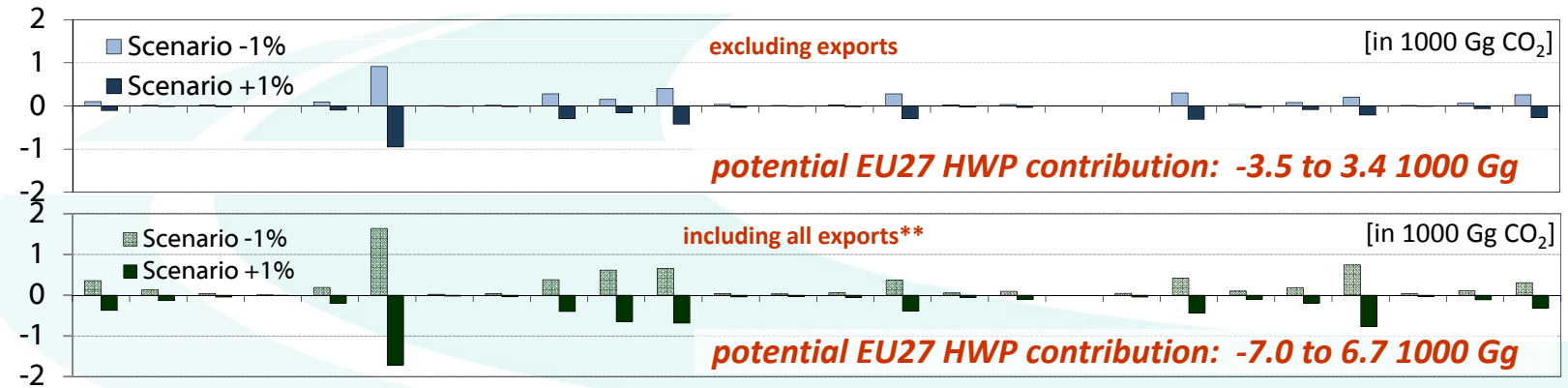


BAU and scenarios for estimating possible contribution of HWP to LULUCF in 2nd commitment period (CP) (Reference Level)

Projection A: BAU for EU27 member states



Potential contribution depending on scenarios (RL based on BAU projections)



Depending on the accounting rules including exported HWP does not necessarily 'increase its contribution', but rather increases compliance risk (exports driven by demand in importing country, which is not under control of accounting country) and uncertainty

- Methods for estimating net-emissions
- Accounting approach for HWP
- Projections of net-emissions from HWP
- Summary

- **Method for calculating net-emissions from HWP pool needs to conform to good practice to neither overestimate the removals (carbon inflow surplus) nor under-estimate the emissions (carbon outflow)**
- **IPCC 2006 Guidelines need to be revised**
- **New accounting approach for HWP**
  - **Instant oxidation remains default**
  - **Links HWP accounting to the activity (forest pools)**
  - **Allows accounting for domestically produced and consumed only, as well as inclusion of exported HWP**
- **Including exports increases compliance risk and uncertainties**
  - **Hardly possible to estimate future HWP contribution for EU27 including exports (number depends on countries' decision what export markets to include or not)**
  - **However, in HWP text the provision is made to report separate by country to which HWP have been exported, using nationally specific data**
- **Calculating projections based on historic and country-specific data only for estimating HWP contribution to LULUCF reference level is possible with existing methods**

→ ***HWP net-emissions need to be included in reference level in order to be consistent (coverage of pools)***

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Thank you very much for your attention

More background information

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