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2006 IPCC Guidance on estimating net-emissions from HWP

IPCC Expert Meeting on HWP, Wetlands and Soil N₂O

19-21 October 2010, Geneva



- **Methods for estimating net-emissions from changing HWP carbon stocks**
- **2006 IPCC Guidelines on HWP**
- **Link to ongoing negotiations under AWG-KP for post-2012 accounting framework**
- **Summary**

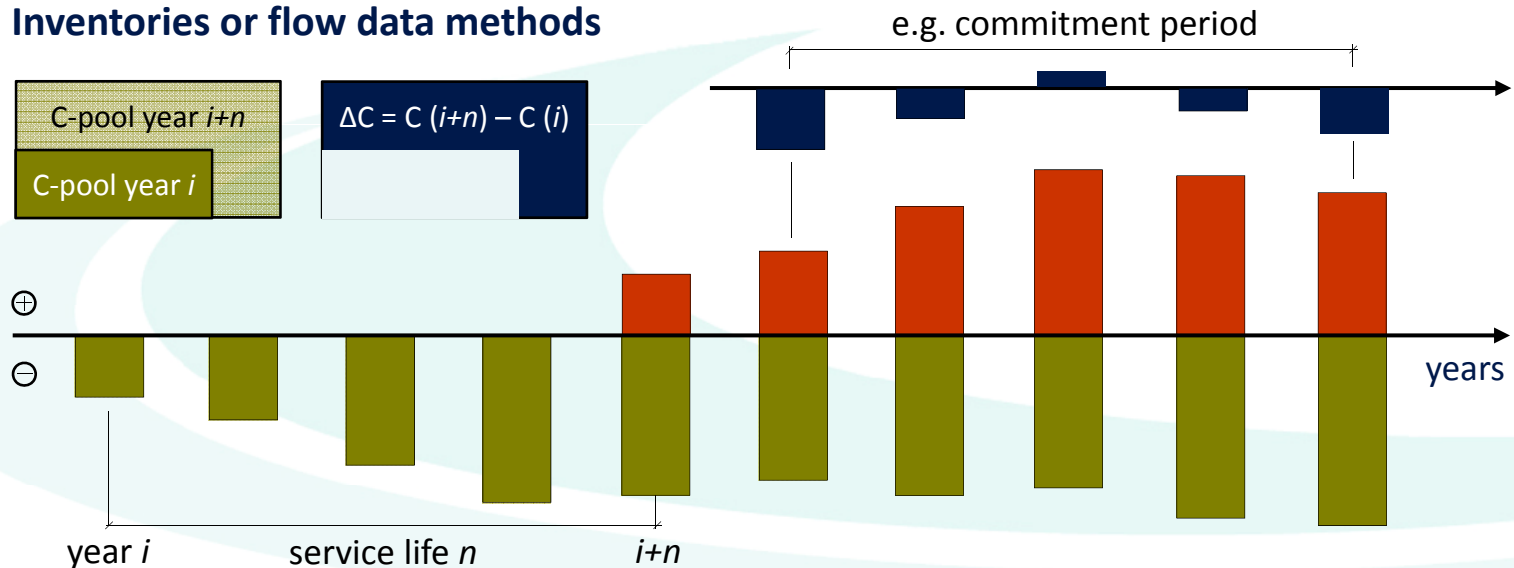
Estimating delayed emissions (storage effect)

- Instantaneous oxidation or the consideration of HWP as an additional carbon pool



→ *"This recommended default assumption (inst. ox.) [...] has the same effect as the case where there are no significant changes in product stocks." ... "there could be still a delay in emissions" (IPCC GPG 2003)*

- Inventories or flow data methods



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

Methods for estimating the hwp pool over time

Inventories

- e.g. building statistics **A**

Flow data

Inflow

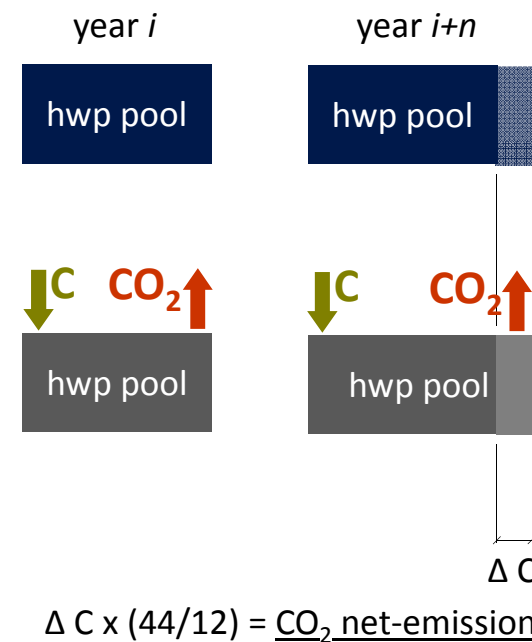
- ▶ Direct estimation
- ▶ Data on production and trade of wood products (commodity data)*
- ▶ Data on roundwood removals

Outflow

- ▶ Direct estimation **C**
- ▶ Estimation using service life data
 - ▶ Linear decay
 - ▶ Logistic decay
 - ▶ Exponential decay*
 - ▶ Gamma distribution
 - ▶ ...

* IPCC 2006 GL tier 1 method

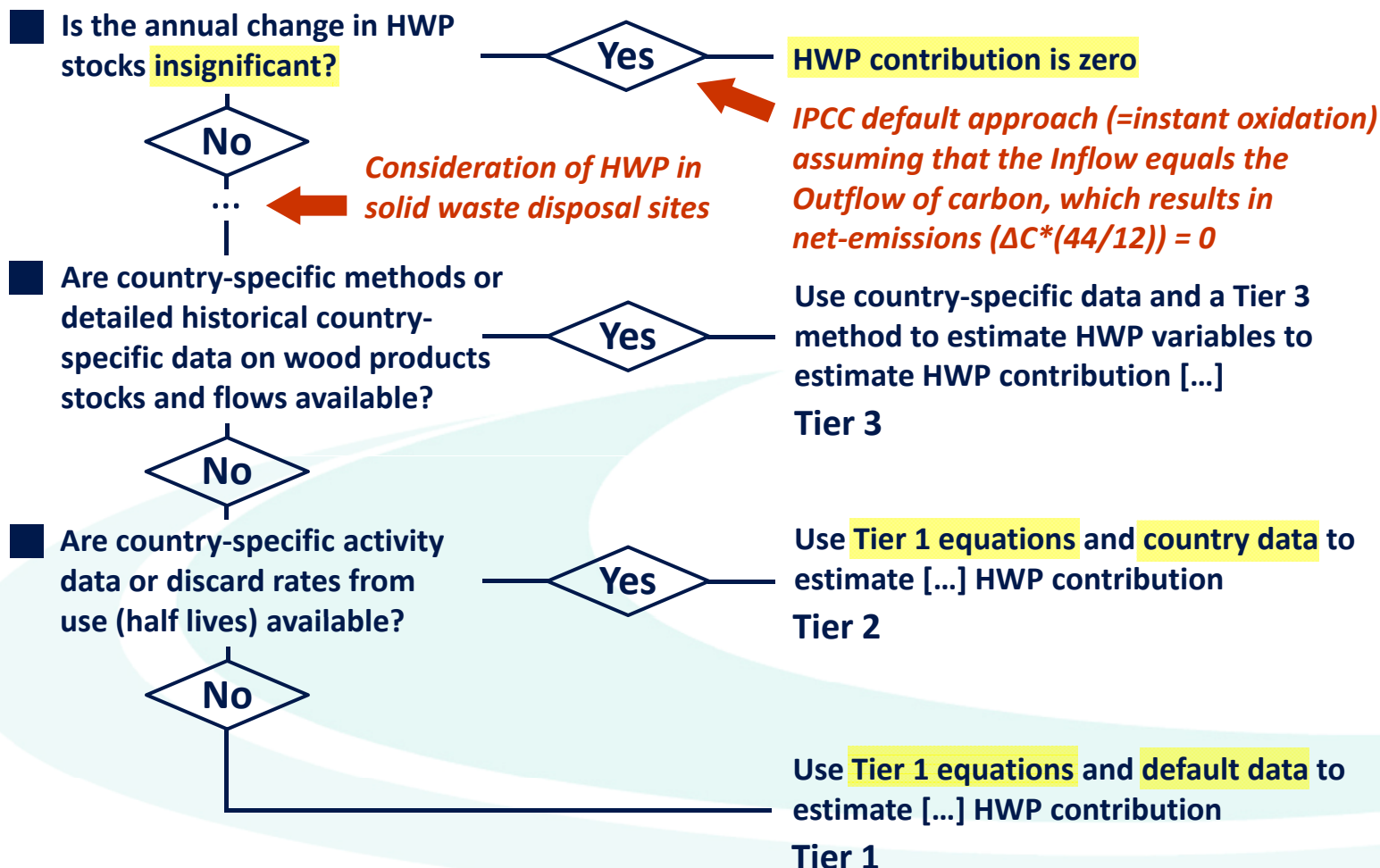
A, C: methods as referred to in 2006 IPCC GL



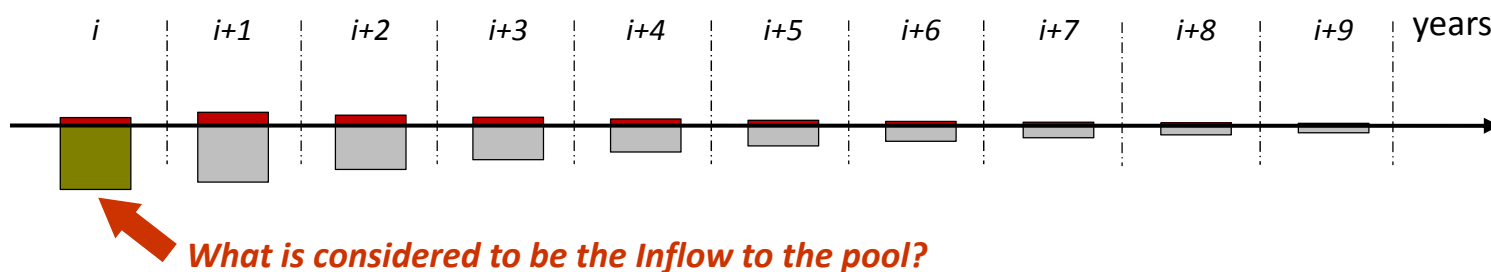


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IPCC 2006 Guidelines on HWP – decision tree for selecting a tier



IPCC 2006 Guidelines – tier 1 method



- Activity data on production and trade of semi-finished wood products provided in international databases, e.g. FAO/ECE (data submitted by countries)

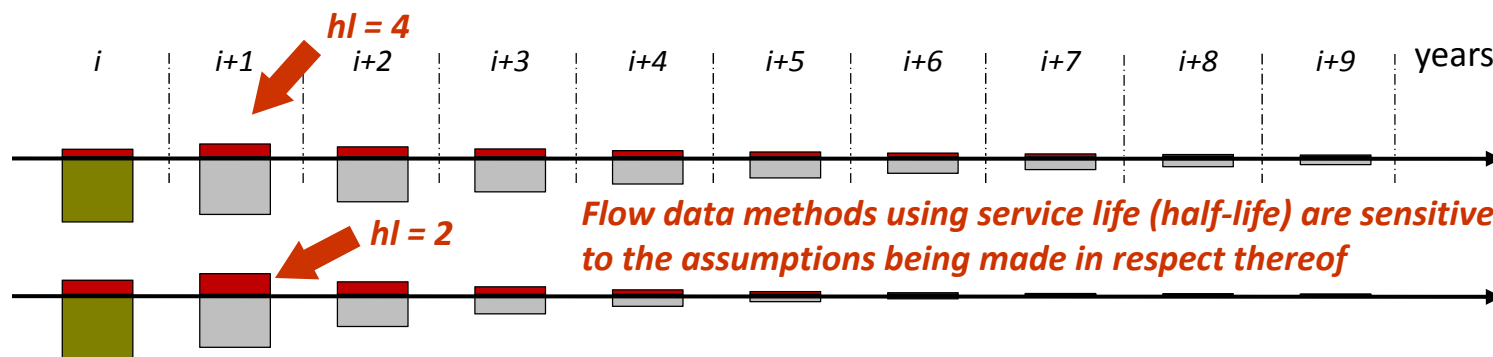
➡ *Information on Inflow available on annual basis for all countries worldwide*

- Outflow to be calculated by means of *first order decay function* (exponential decay) using service life data as driving parameter

➡ *Losses along the process chain are assumed to be included and described realistically with this function as combined with data on semi-finished products* (Pingoud and Wagner, 2006)

- Default carbon conversion factors
 - Sawnwood , other industrial roundwood
 - Wood-based panels
 - Paper products
 - Charcoal
 - Bark
- Default half-life data

Flow data methods using service life (half-life)



IPCC 2006 tier 1 defaults

- Solid wood products (sawnwood, wood based panels)
- Paper products (paper and paperboard)

half-life

service-life

30 yrs

43 yrs

2 yrs

3 yrs

Example for tier 2 estimation: Germany

(combination of information on use of HWP in market segments and specific service life data)

- Sawnwood, coniferous
- Particle board
- Oriented strand board
- ...

30,5 yrs

44 yrs

15 yrs

22 yrs

38 yrs

55 yrs

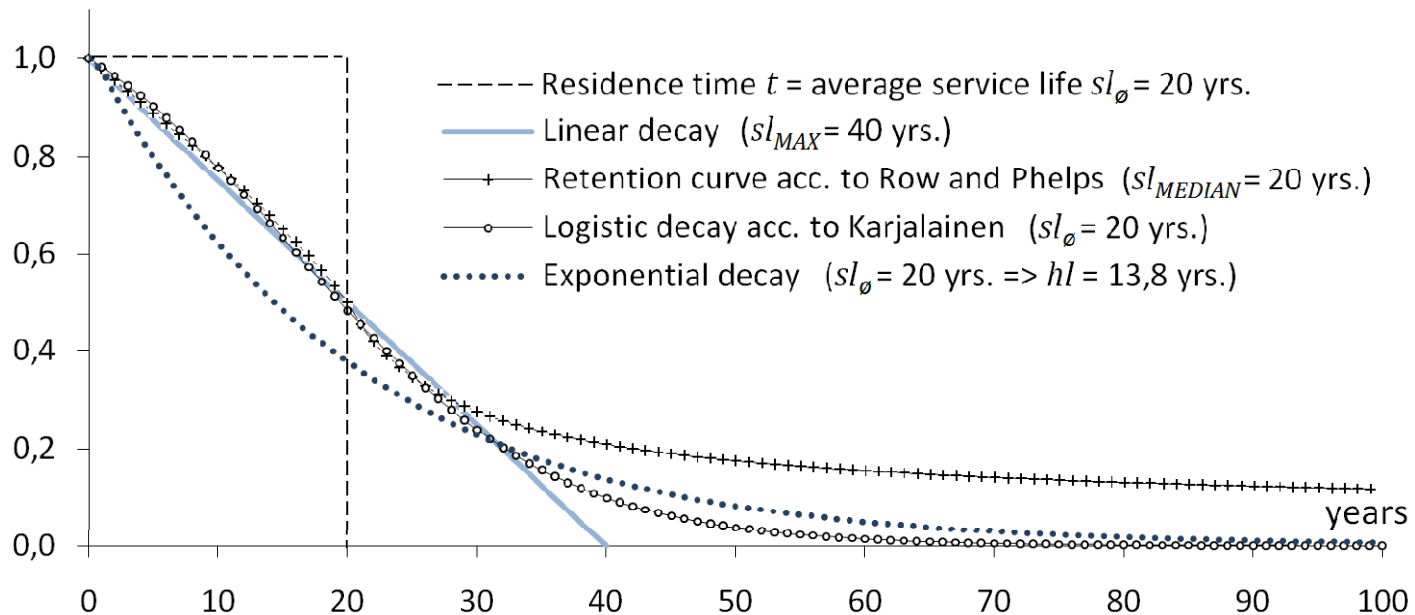
Mass weighted average for 9 HWP categories

24 yrs

34 yrs

➔ *Service life depends on country-specific market use of specific products and can be specified and applied for single product categories (sub-pools) in order to increase transparency and accuracy*

Estimating timing of carbon outflow using service life data

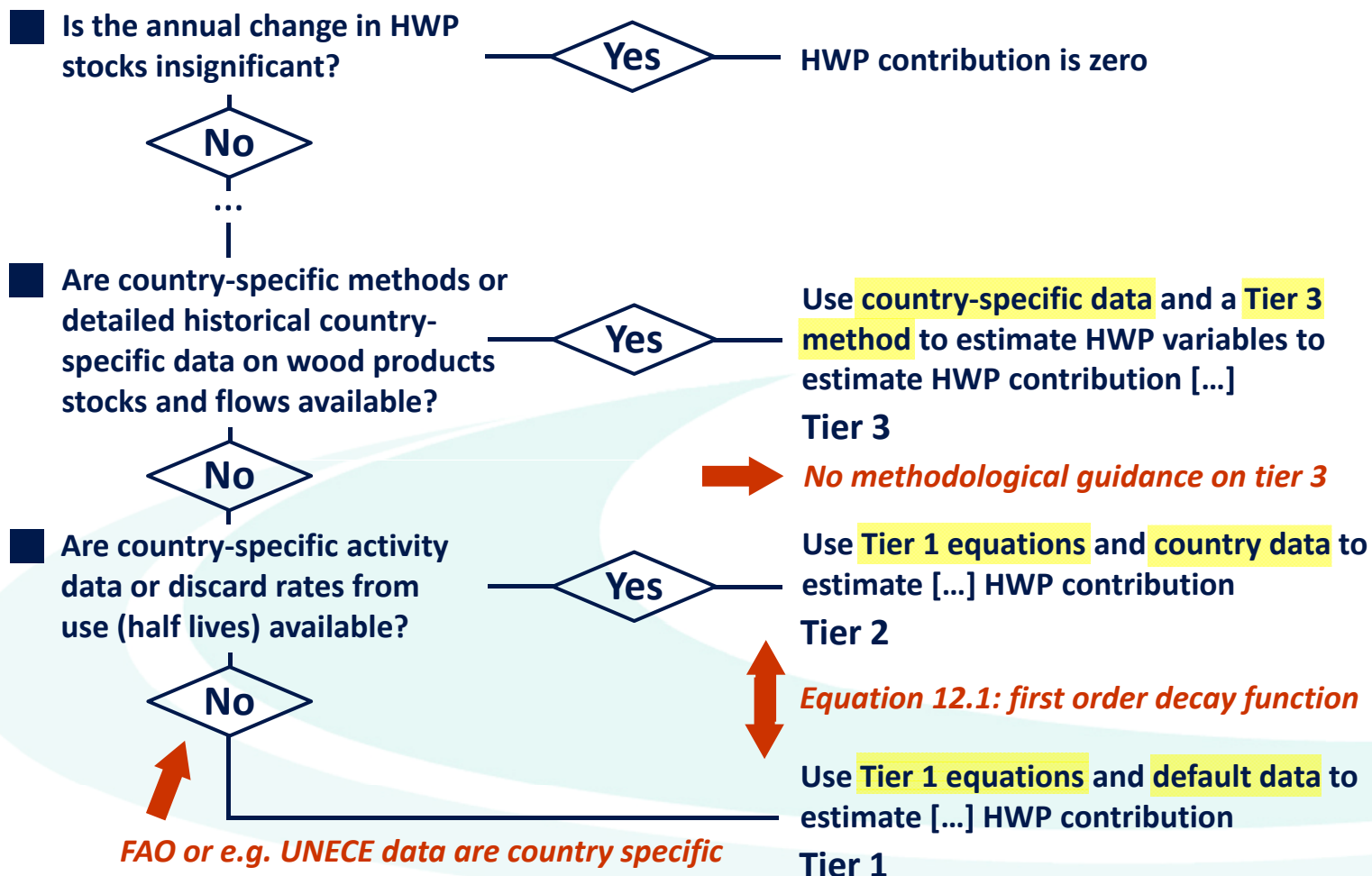


■ New methods: e.g. distributed approach (Marland et al., 2010)

➡ *Despite sensitivity of method to service life assumptions, it safeguards that level of inflow equals the outflow, thus conforms to good practice (IPCC 2003) to neither over-estimate the removals (i.e. inflow in the case of HWP) nor underestimate the emissions (outflow) (the latter is likely when using direct estimations for outflow)*

➡ *However, the application of different decay functions or other methods (Tier 3) is likely to end up in results being less comparable between countries*

IPCC 2006 Guidelines on HWP – decision tree for selecting a tier



2006 IPCC GL for estimating HWP variables

- Variable 1A: Annual change in carbon stock in HWP in use in the reporting country, this is wood carbon that came from domestic consumption of products

➔ *Mistakable text: "Equation 12.2: Estimation of HWP products produced annually from domestic consumption" does not make sense; consumption = production + imports – exports (= stock-change approach)*

- Variable 2A: Annual change in carbon stock in HWP in use, where the wood in the products came from domestic harvest -- trees harvested in the reporting country, this includes exported HWP to other countries

➔ *Calculating variable 2A by Equation 12.3 (= production approach)
(dom prod RNDWD / (dom cons RNDWD + chips + residues) * (prod solid wood + paper products)
assumes that roundwood (RNDWD) exports are being used with the same proportion for subsequent production of solid wood and paper products in importing countries as domestically*

➔ *This assumption can e.g. result in more sawnwood to be included in the estimation than actually has been produced*

- Variables 3,4,5: Annual imports and exports of HWP to and from the reporting country, and annual HWP harvest

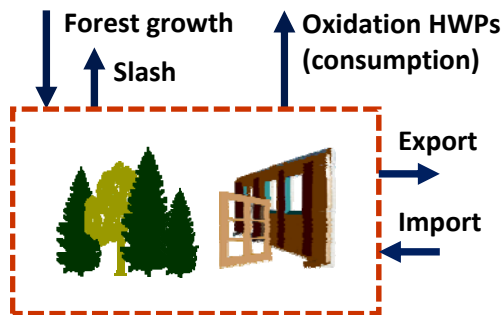
➔ *To be used for atmospheric flow approach only*



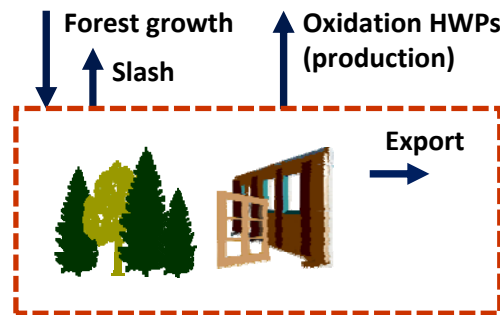
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Previously proposed accounting approaches

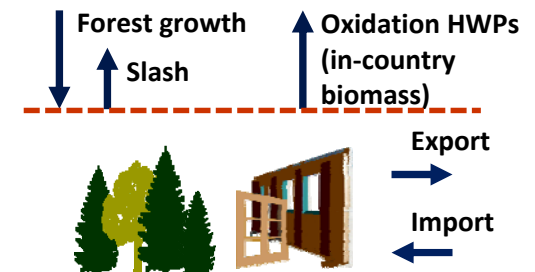
Stock-change approach



Production approach

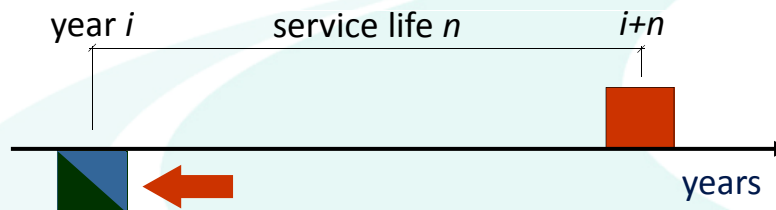


Atmospheric flow app.



➔ Approaches included in IPCC HPW spreadsheet model (tier 1)

----- system boundaries



➔ Activity data being used for flow data method is to be considered in order to differentiate between the origin of hwp

■ Consumption = Production + Import - Export



UNFCCC post-2012 negotiations:

12/2010 Copenhagen: FCCC/KP/AWG/2009/17

06/2010 Bonn: FCCC/KP/AWG/2010/6/Add.2

08/2010 Bonn: FCCC/KP/AWG/2010/CRP.2

New proposal for harvested wood products accounting

[Option 2: (FCCC/KP/AWG/2010/CRP.2)]

21 ter. Emissions from harvested wood products removed from forests accounted by a Party under Article 3 shall only be accounted by that Party. Accounting shall, as a default, be on the basis of instantaneous oxidation, or may be on the basis of estimates of when emissions occur, provided that verifiable and transparent data⁷⁾ are available on the fate of the harvested wood products⁸⁾. ...]

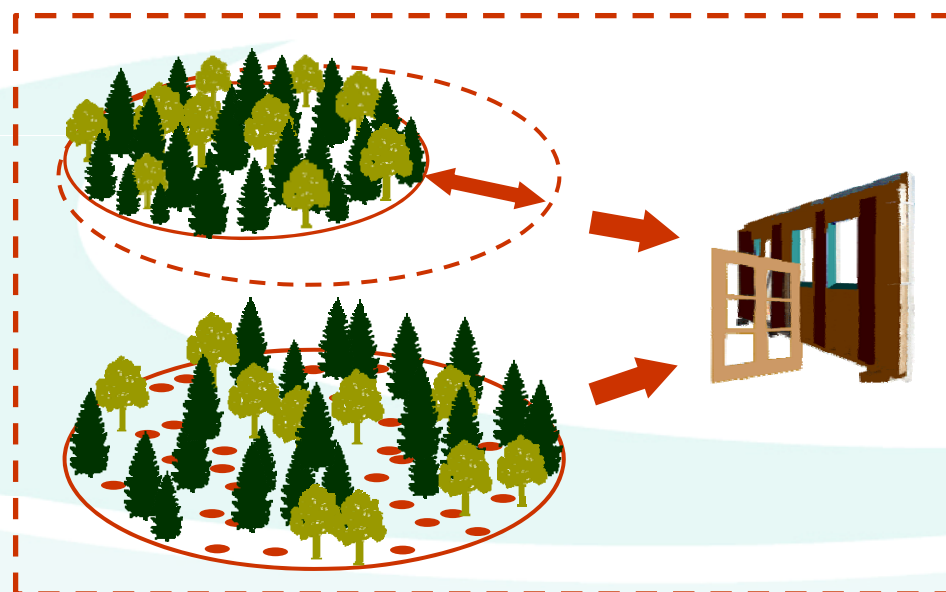
Since 1990

- Afforestation
- Reforestation
- Deforestation

In commitment period

- Forest management

Country producing the timber for hwp



[Option 2: (FCCC/KP/AWG/2010/CRP.2)]

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Footnote 8: Domestically consumed or exported harvested wood products.

...]

➔ 3 step approach

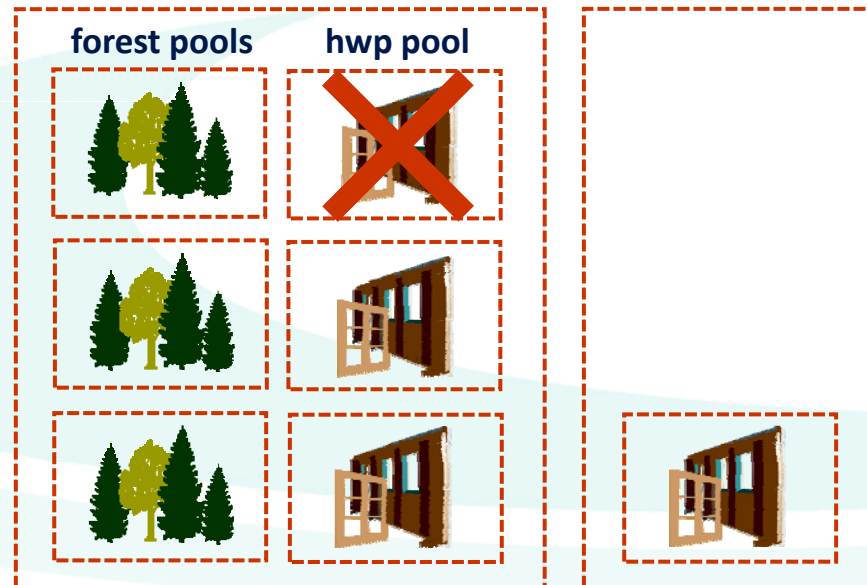
■ Inst. oxidation

■ Domestically produced and consumed only (excluding exports)

■ Domestically produced (including exports)

accounting country A

exp to country B



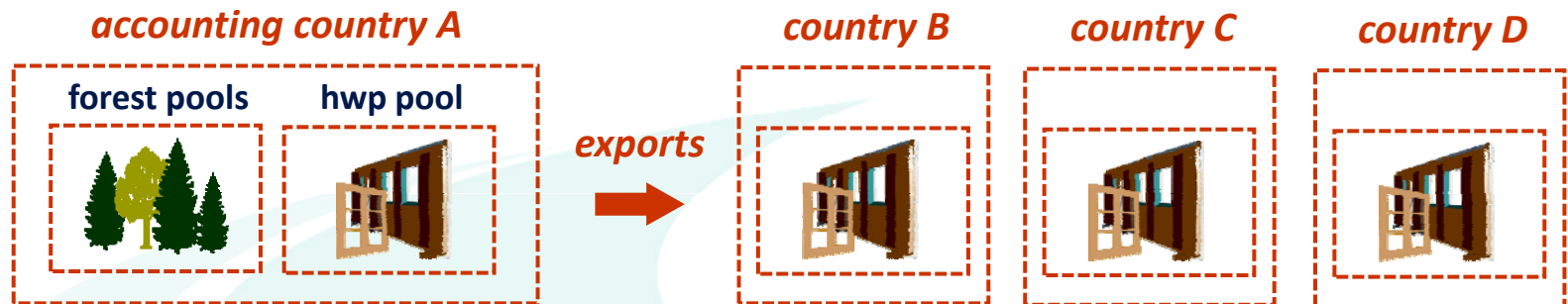
[Option 2: (FCCC/KP/AWG/2010/CRP.2)

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[Option 2: (FCCC/KP/AWG/2010/CRP.2)

21 ter. ...provided that verifiable and transparent data⁷⁾ are available ...

Footnote 7: The Party shall specify product categories and the underlying assumptions used for domestically consumed, and for exported harvested wood products and report separately using nationally specific data on the fate of the wood for its own country and for the importing country. ...]



■ Country-specific assumptions e.g. on:

Half-life:	30	28	22	34
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➡ **Reporting by country ensures transparency and comparability, and facilitates the review and assessment of assumptions and estimates in order to be in line with good practice as postulated by IPCC GPG 2003**

[Option 2: (FCCC/KP/AWG/2010/CRP.2)]

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

21 sexies. Emissions that occur during the commitment period from harvested wood products removed from forests prior to 1 January 2013 [and since 1990] shall also be accounted. Emissions from harvested wood products already accounted during the first commitment period on the basis of instantaneous oxidation may be excluded. Emissions from harvested wood products removed from forests prior to 1 January 2013 may be excluded from the forest management reference level and accounting when the forest management reference level is based on a projection of emissions/removals in the second commitment period, subject to the provision regarding consistency in paragraph 21 septies.

21 septies. Parties included in Annex I shall maintain methodological consistency in the treatment of accounting for emissions from harvested wood products in the forest management reference level and in the commitment period, and in order to do so shall make a technical modification if necessary, and shall report on how the modification was made.

21 octies. Accounting for emissions from harvested wood products shall use definitions and estimation methodologies consistent with the most recently adopted IPCC Guidelines and any subsequent clarifications agreed by the Conference of the Parties.]

HWP in GHG inventories and HWP in accounting framework

- “All Parties [...] shall: (a) develop, periodically update, publish and make available [...] **national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases [...], using comparable methodologies** to be agreed upon by the Conference of Parties.” (UNFCCC, 1992)

➡ *In Parties national GHG inventories information should be given on the annual net-emissions from all HWP within the countries borders*

➡ *Stock-change (method) calculated from all domestically consumed HWP (domestic consumption = production + imports – exports)*

- IPCC guidelines potentially should provide information on how to report HWP in order to account according to the rules which may be decided by a future COP decision

➡ *Guidance can be found in the draft text proposals in Option 2 of the chairs texts within the framework of current UNFCCC AWG-KP negotiations*

➡ *Even if there is no agreement on accounting of HWP under UNFCCC, proposed concepts are helpful for convention reporting (transparency)*



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- IPCC 2006 GL Chapter 12 does not address accounting approaches, but experience in using the guidelines for convention reporting have shown that changes are needed as e.g. the IPCC HWP model refers to previously proposed accounting approaches
- System boundaries for accounting should not be an issue for convention reporting
- Even if there is no agreement on HWP accounting, the newly proposed concepts as regards HWP accounting could be helpful for improving convention reporting
- IPCC GL should provide information on how to report HWP in order to account according to the rules which may be decided by a future COP decision; proposed concepts (e.g. link of HWP accounting to the activities, separate reporting using national specific data for domestic and importing country) are currently not addressed
- No methodological guidance is given for tier 3 estimations: tier 3 should enable and safeguard comparability as postulated by the convention (country specific methods could be used for calibrating proposed tier 2 method)
- Further guidance could be given on how to derive country specific data e.g. on half-life assumptions
- Errors and mistakable text to be corrected:
 - “Insignificant” HWP contribution (p.12.8)
 - “HWP produced from consumption” (p. 12.11)
- Inconsistencies with waste sector

Thank you very much for your attention

More background information

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