



Article 3.4 and CDM outcomes: implications for wood based industries / bioenergy

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IEA Bioenergy Task 38, Canberra

29 March 2001



Questions

- Art 3.3, 3.4 and CDM: How could this affect wood-based industries and bioenergy?
- How could negative impacts on bioenergy be minimized?
- How could sinks crediting be synergetic with bioenergy?

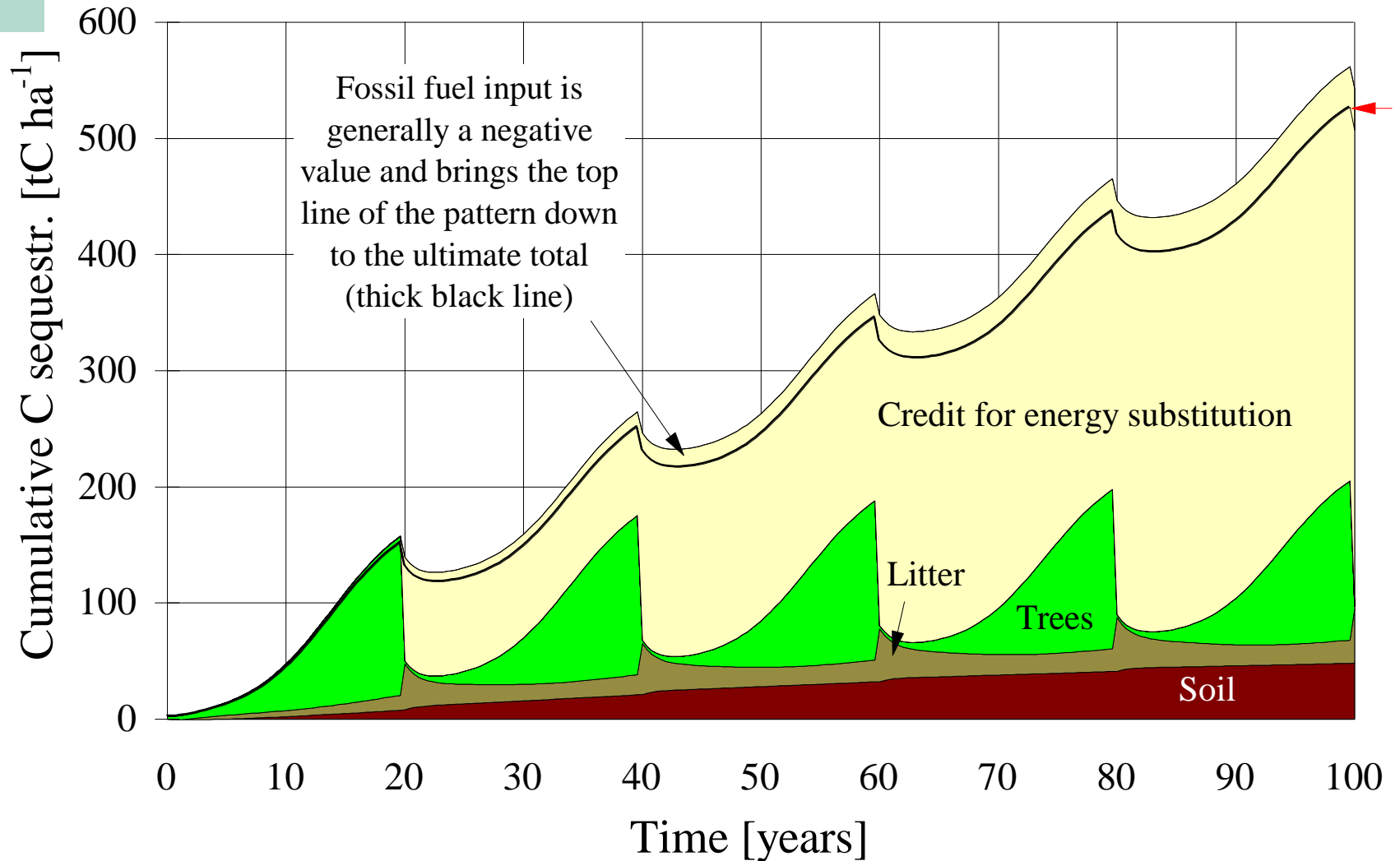


Special role of the forest-based industries

- Raw material from a renewable source (forests)
- Can be energy intensive
- Access to biomass fuels
- Main product contains carbon



Model results: fuelwood plantation on agricultural land





Article 3.3 --> Bioenergy?

- Incentive to establish new biomass plantations (“forest”)
- Disincentive for harvest on Kyoto lands?
- Proposed “fix” could remove incentives for some countries
- Compatible with “JI” biomass projects



Article 3.3 --> Bioenergy?

- 5000 ha deforestation / yr, 10 000 ha reforestation / yr
 - growth rate 1 tC/ha/yr
 - C stock deforestation: average 50 tC/ha
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- C debits: $5\,000\text{ ha} \times 5\text{ years} \times 50\text{ tC} = 1\,250\,000\text{ tC}$.
 - C credits: $20\text{ yr} \times 10\,000\text{ ha/yr} \times 1\text{tC/ha/yr} \times 5\text{ yr} = 1\,000\,000\text{ tC}$,
 - Overall debit: 250 000 tC; Credit Article 3.4: 250 000 tC
 - No incentive for increasing reforestation or decreasing deforestation



Article 3.4

The COP shall ... decide ... **how, and which, additional human-induced activities** related to changes in greenhouse gas emissions by sources and removals by sinks **in the agricultural soils and the land-use change and forestry categories** shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I,taking into account uncertainties, transparency in reporting, verifiability, Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-induced activities for its **first commitment period, provided that these activities have taken place since 1990.**



Article 3.4

- Broad vs. narrow activities
- Land based vs. activity-based accounting
- Current mainstream: land-based accounting for
 - Forest management
 - Cropland management
 - Grazing land management

Caveats:

- Significant portion of “residual sink” may be accounted
- Since 1990?



Article 3.4 proposal

- 15% credit: forest management (1990-2010 proxy)
- 70% credit: cropland and grazing land management

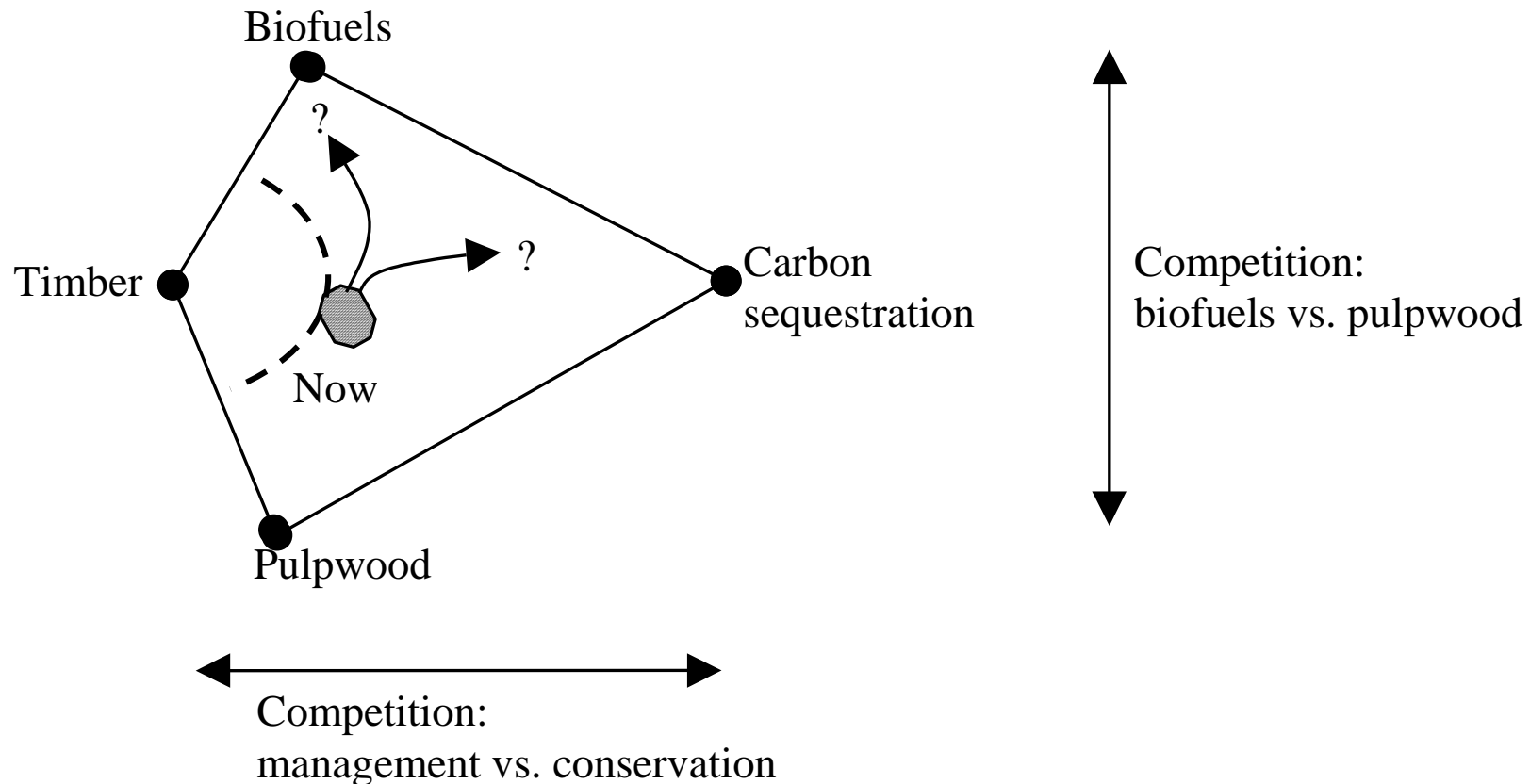


Article 3.4 --> Bioenergy?

- Biomass energy increases C stocks (e.g., croplands, pasturelands):
 - Incentive for biomass production for energy
 - If scale is a concern: could use narrow activities with biofuel component
- Biomass energy decreases C stocks (e.g., forest management):
 - 15% credit: modest disincentive for bioenergy
 - Carbon competes with production of bioenergy and forest-based materials (CP1; but synergies beyond CP1).
 - Matthews UK (1995): longer rotat. (20 yr) --> 0.6 MtC sequ

Trade-offs and market impacts

EXISTING MANAGED FORESTS





Avoiding disincentives for bioenergy

- Discounting (10%), discount factor increases according to changes in bioenergy use (indicator). Little incentive for 3.4 and JI.
- Narrow activities with additionality. If leakage can be addressed --> little impact on bioenergy and wood industries. Full incentive for 3.4 and JI.
- Combination: 5-10% for 1990-2000 activity level, then „project-based“ activities since 200.
- IIASA proposal (cap and auction)



How national rules can differ from intl. agreements

- Example: 15% of 100 MtC = 15 MtC credit.
- Project-based approach (auctioning for 15 MtC)
- Unlimited project-based accounting, cross-sectoral transfers.



Sinks in CDM / Bioenergy

- Can sinks crediting be tied to bioenergy use?
 - No inclusion of sinks
 - Only afforestation and reforestation
 - Requirement of a significant biofuel component (P. Read). Significant export opportunity (but HWP discussion).
 - Liability: Shortfall in biofuels is „seller liability“
 - Permanence: non-permanent carbon is converted into permanent carbon



Impact on forest-based industries

— Risks:

- Dependence on fossil fuels
- Market price impacts through
 - carbon credits (managed forests vs. new forests), depending on ownership
 - increased demand for biofuels

— Opportunities:

- Emission reductions (e.g., gasification c. cycle ; bioenergy)
- Emissions trading, joint implementation
- New a/reforestation



The scale issue

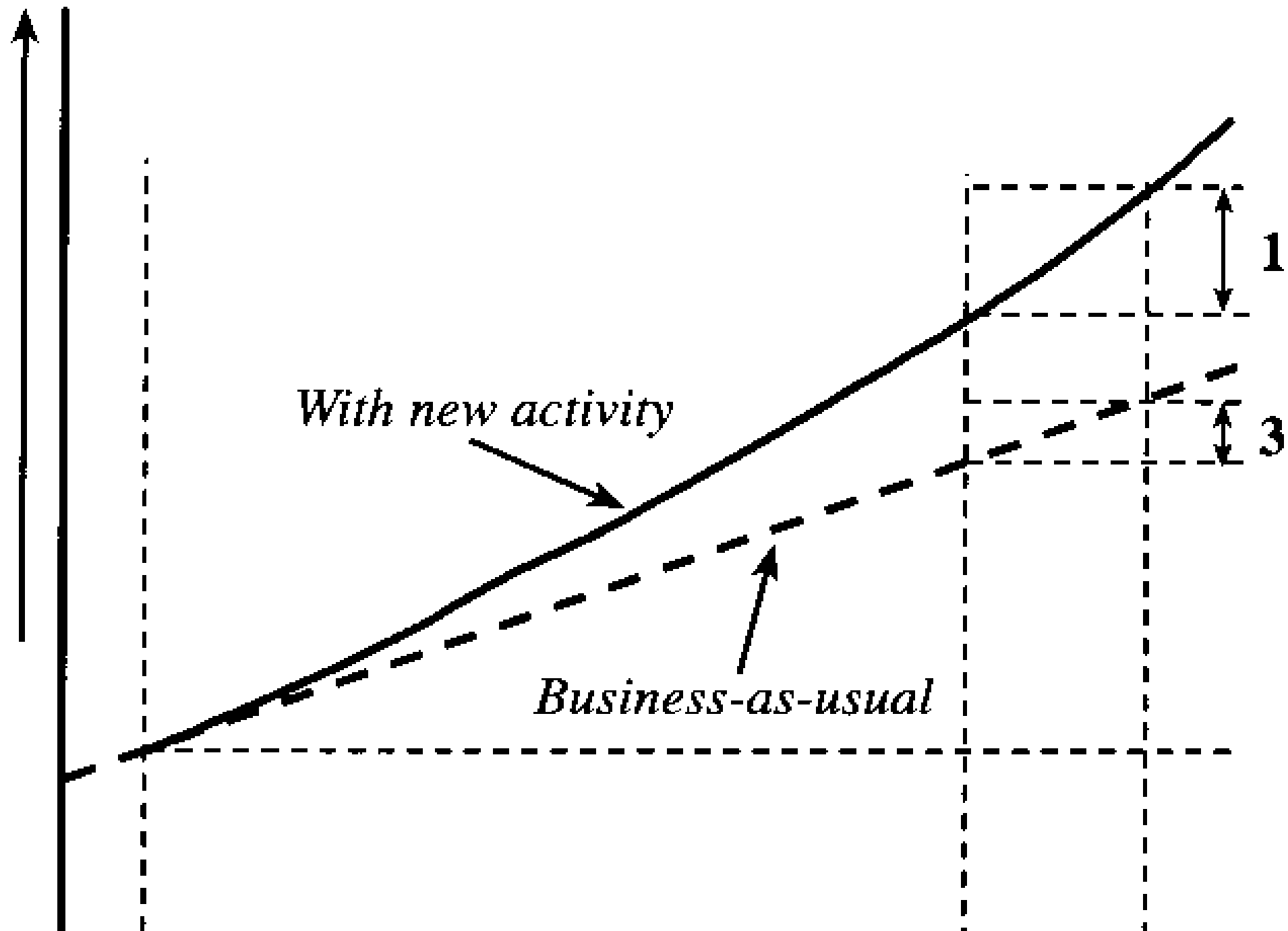
- Worry about diminished incentive to reduce fossil fuels
- Country-specific caps
- Mechanism that adjusts country-targets according to CO₂ market price --> Reduced risk for mitigation projects
- Could include a ceiling for CO₂ market price to address uncertainties (costs of Kyoto implementation).
- Provide bandwidth for CO₂ market price



Summary

- Careful considerations of side-effects of sinks crediting is needed.
- Sequestration activities now can provide biomass resource in the future
- but can also compete against bioenergy in the short term
- Articles 3.3, 3.4 forests, 3.4 cropland and pasture land, and CDM to be addressed separately.
- Should keep UNFCCC objective in mind

Carbon Stock (t C)



With new activity

Business-as-usual

1

3

Simplified methodologies

