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Clean Air Policy

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Integrating Annex 1 Forest and REDD Accounting: Comprehensive Biomass Accounting

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Presentation Overview

- Annex 1 forest accounting
- REDD accounting
- Solving current problems by integrating Annex 1 & REDD accounting with comprehensive biomass accounting

Problems With Annex 1 Forest Accounting

- Only required to count afforestation, reforestation and deforestation since 1990
- May elect not to count fluxes from managed forest, crop or grazing lands
 - » Parties will only count if they have a net sink
 - » Amount of sink or source that is counted is capped at about 1% of Party's assigned amount, with each country's cap given in Decision 16/CMP-1, annex
 - 1% sink may be BAU, giving no incentive to increase sequestration
- Fluxes from “unmanaged” forests and other lands (e.g. residential, suburban, other) are not counted

Forest Accounting Problems, Continued

- Forest management baseline amounts use gross forest sequestration but compliance counted using net of sequestration and LULUCF emissions
- No agreement on how to count harvested wood products (HWP)

Why These Methods were Adopted

- During Kyoto negotiations, concern about
 - » Non-anthropogenic sinks
 - CO₂ fertilization increasing growth
 - Nitrogen air pollution fertilization
- Baseline forest growth—especially on unmanaged lands—may be greater than emission reduction commitment
- Many countries had limited information about forest carbon fluxes

Main 2008-2012 “Fixes”

- Don't count “unmanaged” land fluxes to “factor out”
- Limit forest management credits to about 1% of assigned amount, to “factor out”
 - » Addresses concern that re-growth of areas harvested pre-1990 would weaken national Kyoto targets
- If ARD is net emission, and have FM sink, may count FM sink beyond 1% sink cap, up to 165 Mt CO₂ for period, to offset ARD emission
- Net accounting of emissions and sinks for croplands, grazing lands, and revegetation, for both baseline and 2008-2012

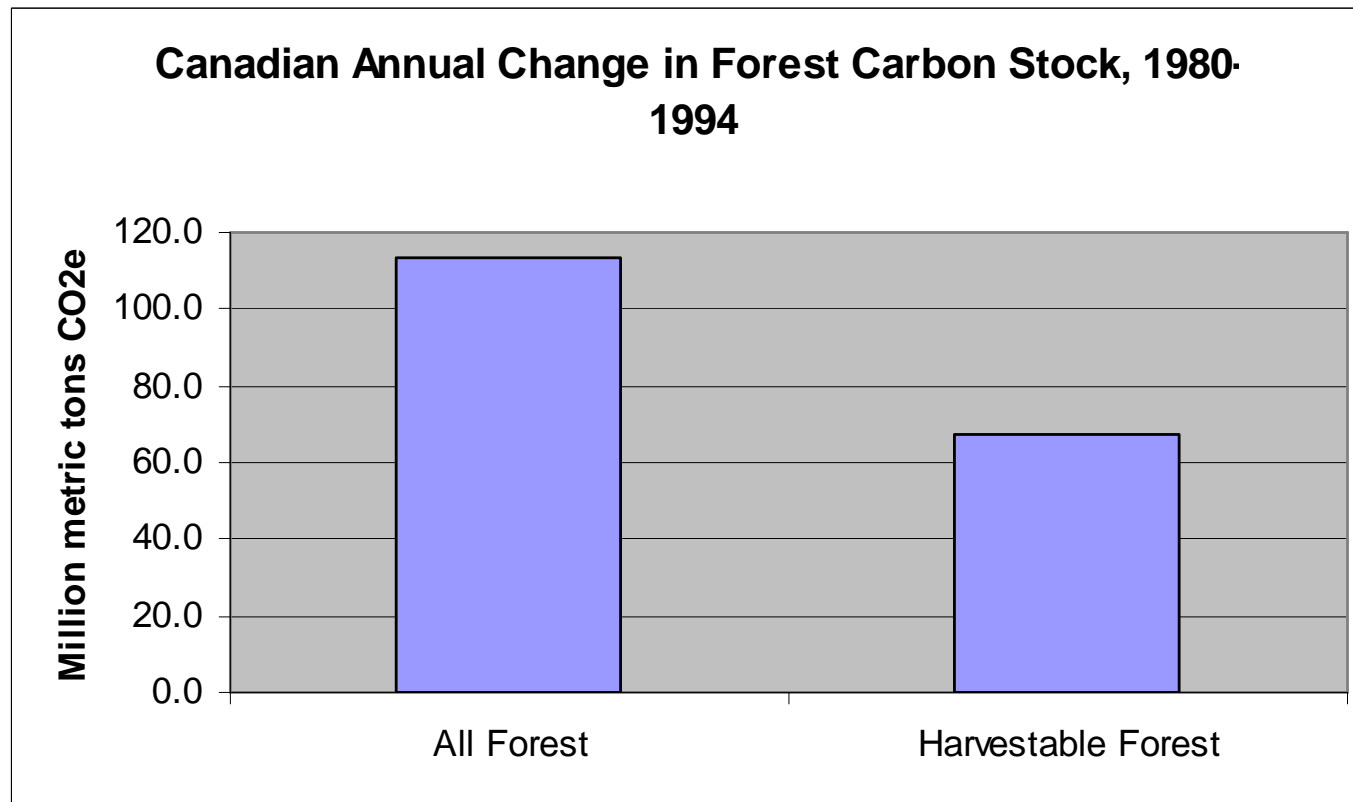
Ongoing Problems

- Parties may opt not to count forest degradation emissions
- Fluxes from “unmanaged” forests are not counted
- IPCC can not give general factors for non-anthropogenic effects
- Some countries have large annual variation in forest carbon flux from wildfire and insect mortality
- Conflicting HWP accounting methods, particularly for counting imports and exports

Examples of Count \neq Flux

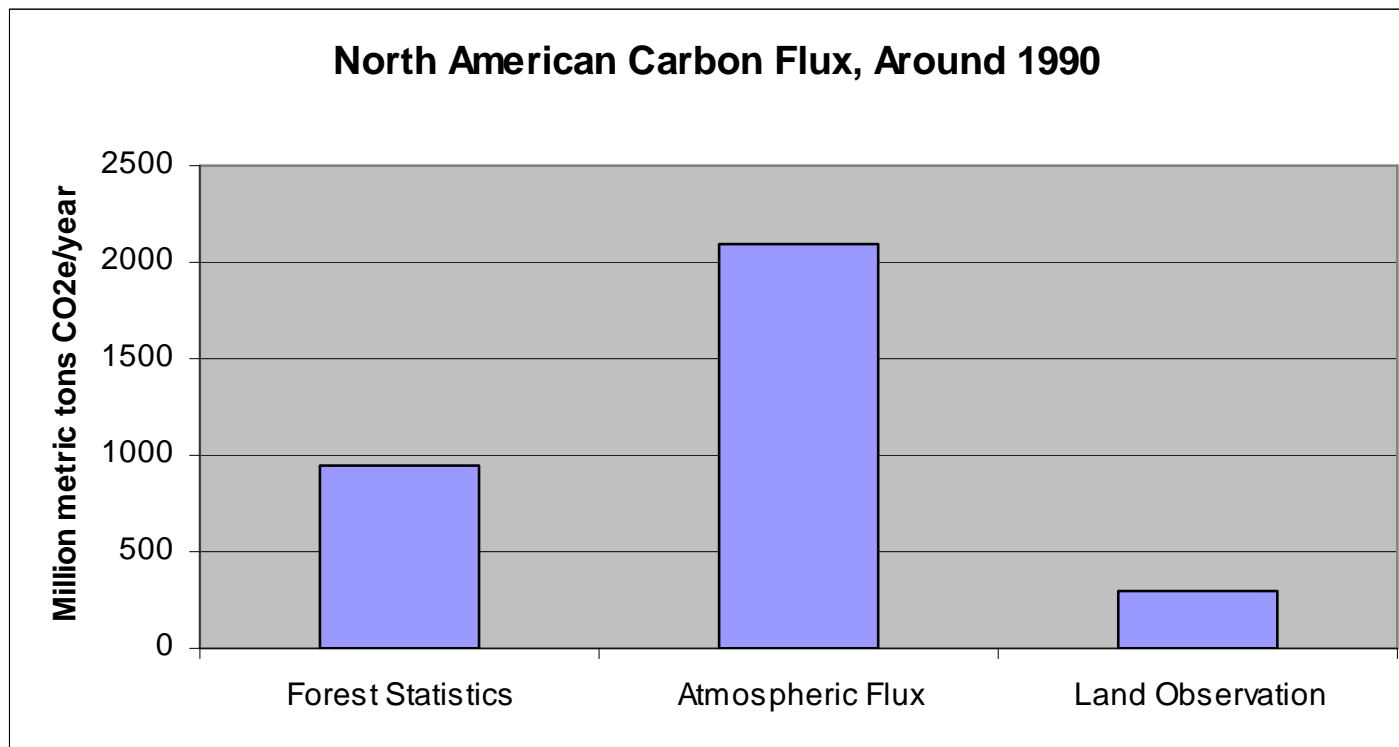
- Fluxes counted when only counting afforestation/deforestation and managed forest can be much less than total forest or total terrestrial flux
- Examples on next slides:
 - » Canada, total forest versus harvestable forest (harvestable forest is proxy for managed forest)
 - » North America, forest versus total terrestrial flux

ARD + Managed Forest Flux \neq Forest Flux



Using harvestable forest as a proxy for Kyoto-reported managed forest versus all forest, calculated from UN-ECE/FAO Forest Resources Assessment, 2000, Table 37 & Annex 3B.1, assuming forest is 2/3 conifer.

Forest Flux \neq Terrestrial Flux



Source: IPCC 4th Assessment Report, WG3.

Difference between atmospheric flux and other methods is attributed to carbon stock change in non-forest lands, soil carbon, sequestration of eroded carbon, & harvested wood products (Goodale et al. 2002. Ecological Applications. 12: 891-899.)

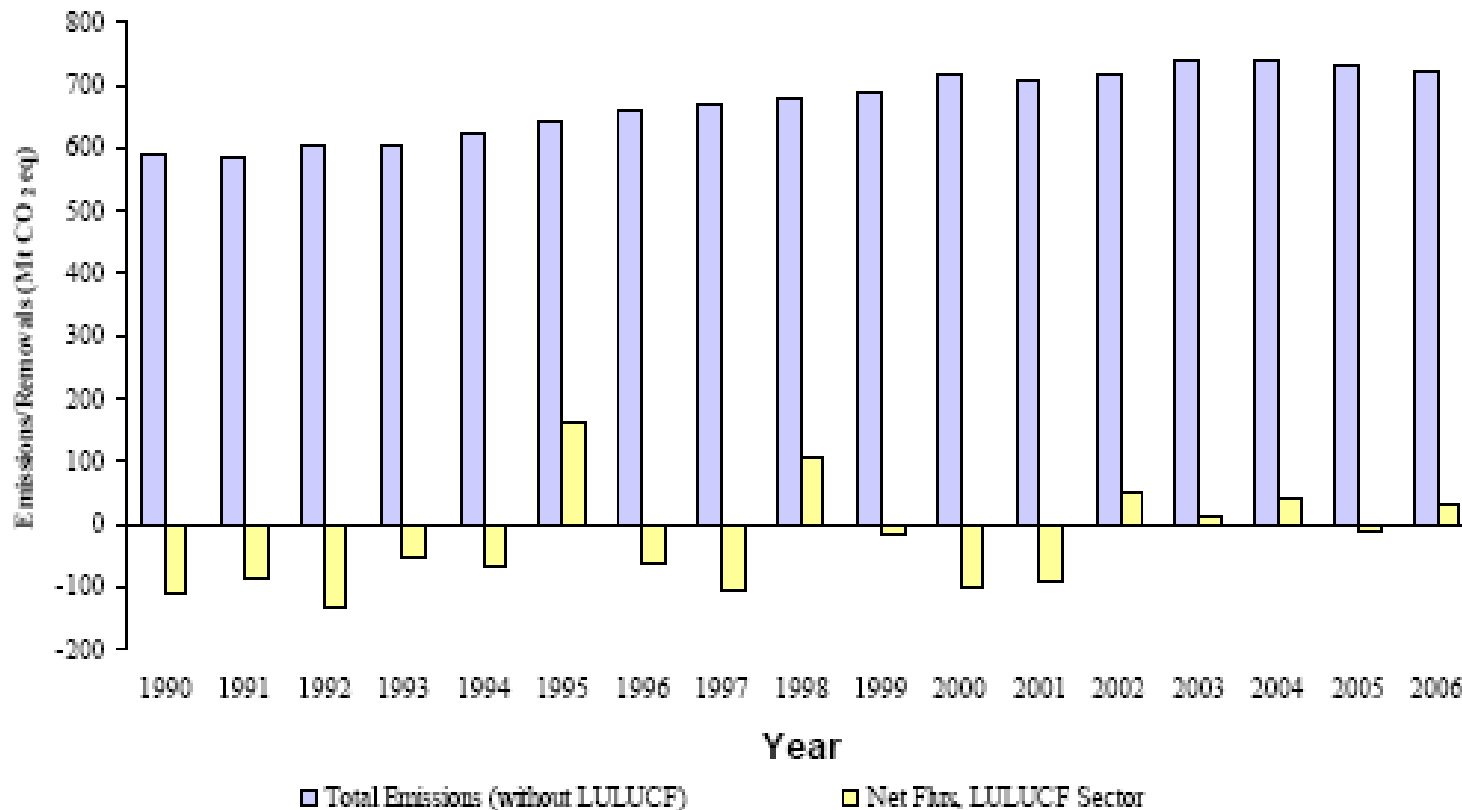
Goals for Post-2012 Accounting

- Counts reflect “what the atmosphere sees”
- Give appropriate incentives and disincentives
 - » Incentives to increase carbon stocks
 - » Disincentives to decrease carbon stocks
- Simplicity and understandability
- Comparable accounting for Annex 1 & non-Annex 1 countries

A Solution

- Comprehensive woody biomass accounting—all lands
 - » Count harvested wood products in country of harvest
 - » Gives incentive to manage disturbance
- Above a threshold percentage, carry forward non-anthropogenic sink or emission amounts to next commitment period (Canada)
- No penalty for harvest, if net forest carbon stock does not decrease

Carry-Forward Addresses Annual Variability



A1 Implementation

- Negotiate forest emissions as component of assigned amount
 - » Consider past emissions/sinks
 - » Consider trends & expected changes, including stand age effects and disturbance trends
 - » Can require improvement over past
- Use international inventory review process to check inventories and claims that carry forward amounts are non-anthropogenic

REDD: Introduction

- The Bali Action Plan highlighted the importance of reducing emissions from deforestation and forest degradation in developing countries (REDD)
- Bali Plan further calls for consideration of other forest activities: conservation, sustainable forest management, and enhancement of carbon stocks
- Key REDD questions for post-2012:
 - » If national-level accounting is adopted, how should each activity (including A/R under the CDM) be addressed
 - » Whether/how to develop a combined forestry program integrating multiple activities and a unified carbon accounting system

REDD Accounting Challenges

- How to maximize reductions (participation, activities)?
- What is the right scale? National, sub-national?
- How are baselines set?
 - » Very challenging with conservation
- How can deforestation, carbon be measured accurately?
- How is leakage and permanence addressed?
 - » A/R, SFM, conservation can reduce leakage, enhancement can help permanence

REDD Accounting Challenges

- How to avoid double-counting reductions, financing?
- How to address the potential of replacing virgin forests with plantations?
- How to measure degradation?
 - » Satellite data often inadequate for monitoring
- Address harvested wood products?

Comprehensive vs. Activity Accounting

- Goal is to report “what the atmosphere sees” with comprehensive accounting, but also maintain permanence, reduce leakage, etc.
- Comprehensive Approaches: Integrated REDD framework
- Activity-Based Approaches
 - » Keep CDM, REDD et al separate, monitor individually
 - » Integrate some but not all activities

A Comprehensive Approach

- Integrated national REDD framework
- Each country quantifies and reports net carbon flows at the national level
- Countries detail activities to be undertaken at the start
- Developed countries provide some funding up front
- Governments are free to allocate international funding internally as they choose

A Comprehensive Approach

- Countries measure (i.e. remote sensing plus ground surveys) and report total net carbon changes, but are not required to quantify emissions from individual activities
 - » Level of effort required for accurate accounting could be high for some countries and/or activities
 - » Would maintain credibility of A/R and REDD system
- Final payments adjusted based on actual carbon reductions achieved (agreed in advance)
 - » A/R CDM credits would be deducted from total

A Comprehensive Approach

- Countries can focus on most promising activities, high-priority options, can shift over time if some actions fail
- Would need to decide procedures if national forest programs fail entirely
 - » How to address funding already disbursed?
 - » Should successful projects get paid if national programs fail?
- Significant administrative, measurement and monitoring capacity required could limit participation

An Activity Approach

- Net reductions reported at national level
- Each country must include REDD, elects whether to include A/R, SFM or others, quantifies and reports net carbon flows for each activity
- Procedures, accuracy required for each activity depends on state of technology, national circumstances
 - » Can help incentivize actions that are more difficult to measure
 - » Preserves credibility of A/R and other methodologies without limiting scope of activities

An Activity Approach

- Activities tracked include geographical location
 - » Guards against double-counting
- Developed countries provide funding up front for capacity building, monitoring, etc.
- Tracking of discrete activities may effectively function like individual projects
 - » May encourage greater private sector participation, financing
- Can be used to prevent replacement of virgin forests with plantations
 - » Helps to ensure permanence by reducing likelihood of disease, fire, etc.

An Activity Approach

- May help to “fine tune” degradation accounting
 - » Easier to determine if forest has passed non-recovery point, track degradation that does not affect short-term carbon content
- Gives countries using SFM confidence they will not be penalized for initial or short-term emissions
 - » Short-term emissions may be left out if can be shown to be below a set threshold, long-term management is sound
 - » May help identify whether SFM is creating leakage
- May be easier to determine if activities are well-managed or may lead to degradation
- Can help prevent compensation of natural growth vs. additional carbon stock enhancement, gaming

Policy Options: Summary

- Comprehensive
 - » Simpler to administer, maximizes flexibility
 - » Avoids financial and emissions double-counting
 - » Requires uniform quantification methodology
 - » Risk of replacing virgin forests with plantations
 - » May limit near-term participation, reductions if proposed activities cannot meet standard
- Activity
 - » May allow more accurate accounting for each activity
 - » May encourage broader participation
 - » Encourages activities that support long-term stand health
 - » Very complex to implement

REDD Proposal

- Require comprehensive national accounting for participation
 - » Sub-national or activity-level reporting would be allowed for some countries unable to do national accounting in initial period
 - » Countries unable to do full accounting are not paid for reductions, but receive support for capacity building
- Additional rules requiring tracking of some specific forestry activities may be set in special cases
 - » E.g., if plantations in rapidly deforesting countries will account for a large share of potential reductions
 - » Helps developing countries to further improve monitoring and implementation capacity



HWPs: Count in country of harvest

Conservation

- Conservation is crucial to addressing international leakage (e.g., Congo Basin)
- But including conservation in REDD very difficult
 - » Raises major questions of additionality and comparability with other REDD baselines
 - » May be data-intensive
 - » Low to moderate losses of carbon may be difficult to detect
- How to address conservation?
 - » Provide support to countries currently not deforesting but are potential sources of leakage (e.g., funds)
 - » End-use measures
 - » International program to reward conservation only if global forestry emissions fall

Global Accounting Goals

- Accounting accurately depicts atmospheric fluxes
- Credit only improvements in fluxes
 - » Increases in net carbon sequestration
 - » Decreases in net biomass carbon emissions
- Optimal use of market access versus funds for REDD financing

Current Problems

- Annex 1 country forest accounting is incomplete and riddled with exceptions
- Have not yet figured out how to make REDD credits compliance quality
 - » Especially leakage, permanence, and effectiveness
- Capacity for REDD measurement of degradation is limited
 - » Some countries can measure deforestation; many cannot
- Current A1 targets were set without REDD credits

A Solution for A1 and REDD

- Comprehensive biomass accounting—all lands
 - » Count harvested wood products in country of harvest
 - » Gives incentive to manage disturbance
- No assessment of intention at national level
 - » Can avoid having to assess additionality
 - » May use intention at sub-national scale, to allocate funds
- Participation of all major emitters obviates need to quantify leakage
 - » Domestic leakage captured within national inventory
 - » International leakage captured in inventories of other countries

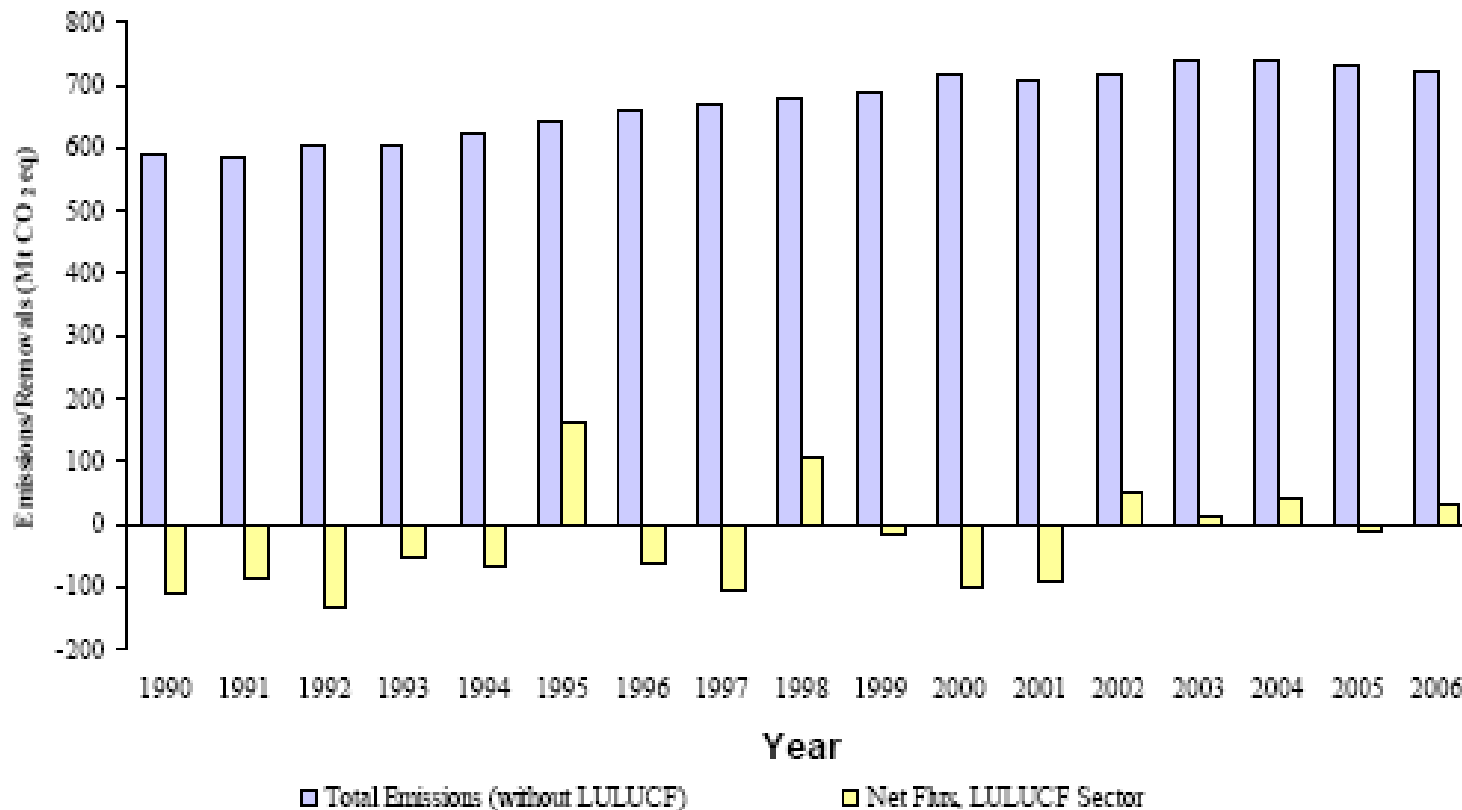
Implementing Comprehensive Accounting

- Negotiate forest flux as component of assigned amount (A1) or reference emission level* (non-A1)
 - » Consider past emissions/sinks, trends & expected changes, including stand age effects and disturbance trends
 - » Require improvement over past performance
 - » Negotiation is incentive to know own forests
- Only countries with emission caps can accrue removal units for net sequestration
- Create new type of unit for countries without caps that reduce biomass emissions to less than their crediting baseline

Limit Counting of Extreme Fluxes

- Limit current-period counting of non-anthropogenic fluxes
 - » Extraordinarily high emissions from wildfire, insect mortality
 - » Unusually high sequestration from fast growth periods
- Beyond threshold, sink/emission amounts are carried forward to next commitment period (Canada)

Carry-Forward Addresses Annual Variability



Quantification

- Combine remote and ground based methods
 - » Remote methods: Global Observation of Forests and Land Cover Dynamics (GOFC-GOLD) REDD Sourcebook of methods and procedures for monitoring, measuring and reporting, <http://www.gofc-gold.uni-jena.de/redd/index.php>
 - » Ground based methods: Necessary to quantify degradation; several national inventories are models; need to expand coverage beyond timberlands to all lands
- Require tailored measurements for peatlands
- Other pools to add to inventories over time as appropriate: Forest floor, soil, erosion, leaching of dissolved organic carbon

International Leakage

- Assumption is that all countries with large emissions are in the system and report their emissions
- Not estimated for A1 industrial emissions because emission “leaked” from one country show up in the inventory of another country
- Same approach could be used for forest emission leakage

Harvested Wood Products

- Has been debate in A1 accounting whether to count wood product carbon in harvesting country, consuming country, or other
- Accurate harvest emission counts for REDD require counting HWP carbon in country of harvest
 - » Not counting wood product carbon overstates emissions from harvesting, which can overstate REDD reductions
 - » Counting wood product carbon internalizes part of effect of displacing harvest because project loses credit for displaced HWP carbon
- Count as total oxidation over specified product lifespan
 - » Allows direct counting of landfill internment



Permanence

- Count biomass emissions same as fossil fuel emissions
- Emissions are counted for each commitment period
- Can separate accounting periods
 - » Mitigation in one accounting period may be independent of performance in subsequent accounting periods (permanent)
 - » Alternatively, A1 RMUs may be canceled, to extent that they have been created
 - If emissions are greater than RMUs, can surrender AAUs or carry forward excess emissions using fossil emission rules

Consequences of Not Meeting Crediting Baseline

- Grants: May be no pay-back if do not achieve expected emission mitigation
- Funds: Future payments may be contingent on emission mitigation
- Compliance credits: Only credit achieved emission mitigation; must acquire compliance units for emissions beyond baseline amounts
 - » If were to have buyer liability for reversals, price of offsets would be lower than price of AAUs

May Change Mechanisms over Time

- May change mechanisms from one commitment period to the next, as countries jointly agree
- Grants have fewer obligations for developing countries but expected to provide less money
- Fund-based REDD mechanism could integrate with carbon market as it matures (e.g. Dual Markets proposal)
- Offsets/Credits usable for A1 compliance will have to meet rigorous standards and have to be counted as emissions if reversed

Phasing Implementation

- Start with 2-3 periods using grants/funds
 - » Trial periods, like EU ETS Phase 1
 - » Trial periods can be short, e.g. 2-3 years
 - » Build in-country quantification capacity
 - » Negotiate crediting baselines
 - » Build international review capacity
 - » Need multiple trial periods because performance during first period will not be known until second period
 - » Fund payments may be *ex ante*
- If trial results are satisfactory, can switch to offsets or removal units

Advantages of Comprehensive, Integrated Accounting

- ⑩ Addresses existing A1 accounting problems (especially incomplete accounting)
- ⑩ Developing countries can focus on most promising, high-priority options; can shift over time if some fail
- ⑩ Eliminates both financial and emissions double-counting risks under REDD
- ⑩ Builds non-A1 capacity to measure, thus manage, forests
- ⑩ Gives incentive for all countries to conserve and enhance all forests

Thank You

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