Rationale for, and Design of, Forest Carbon Feebates

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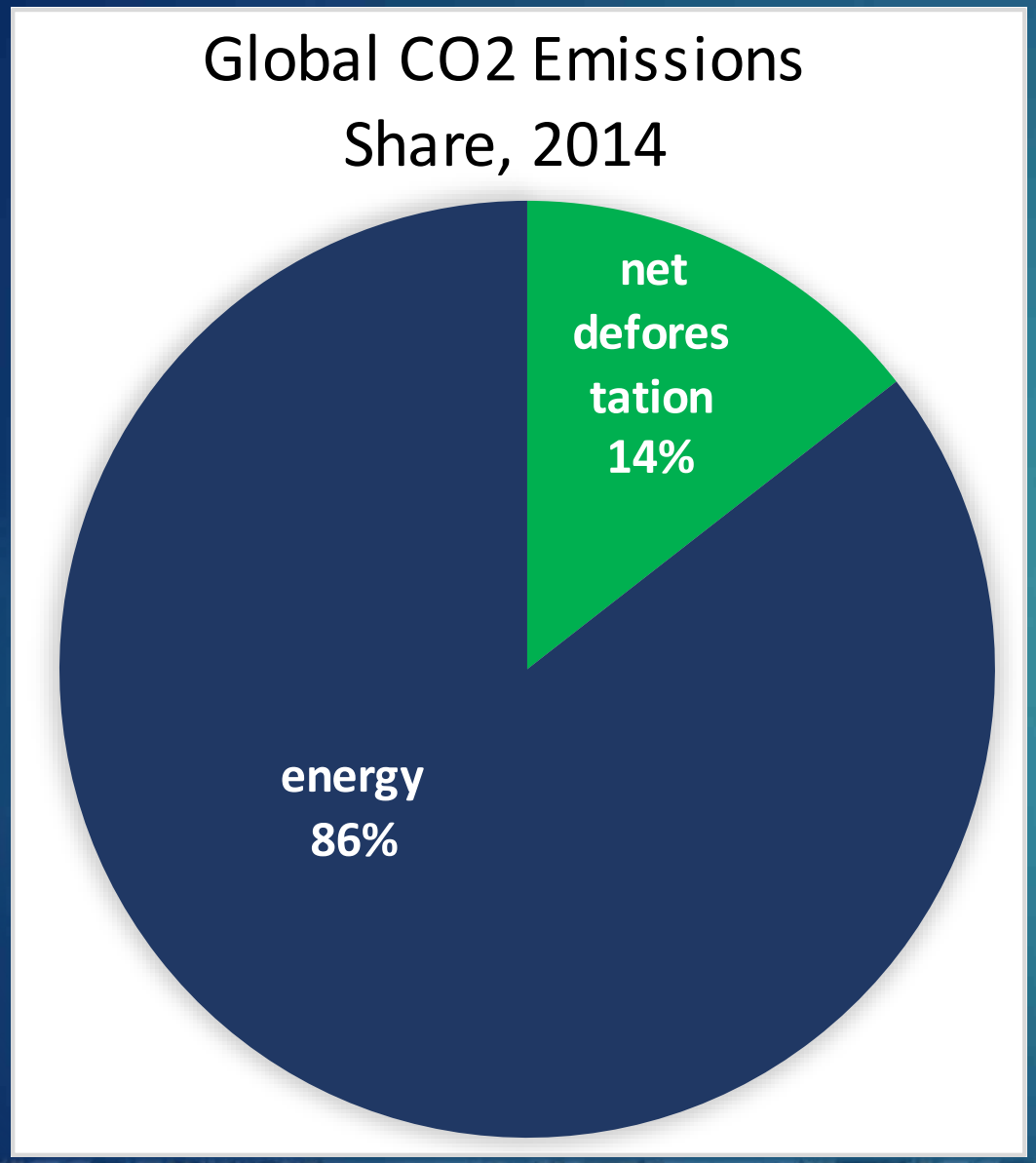
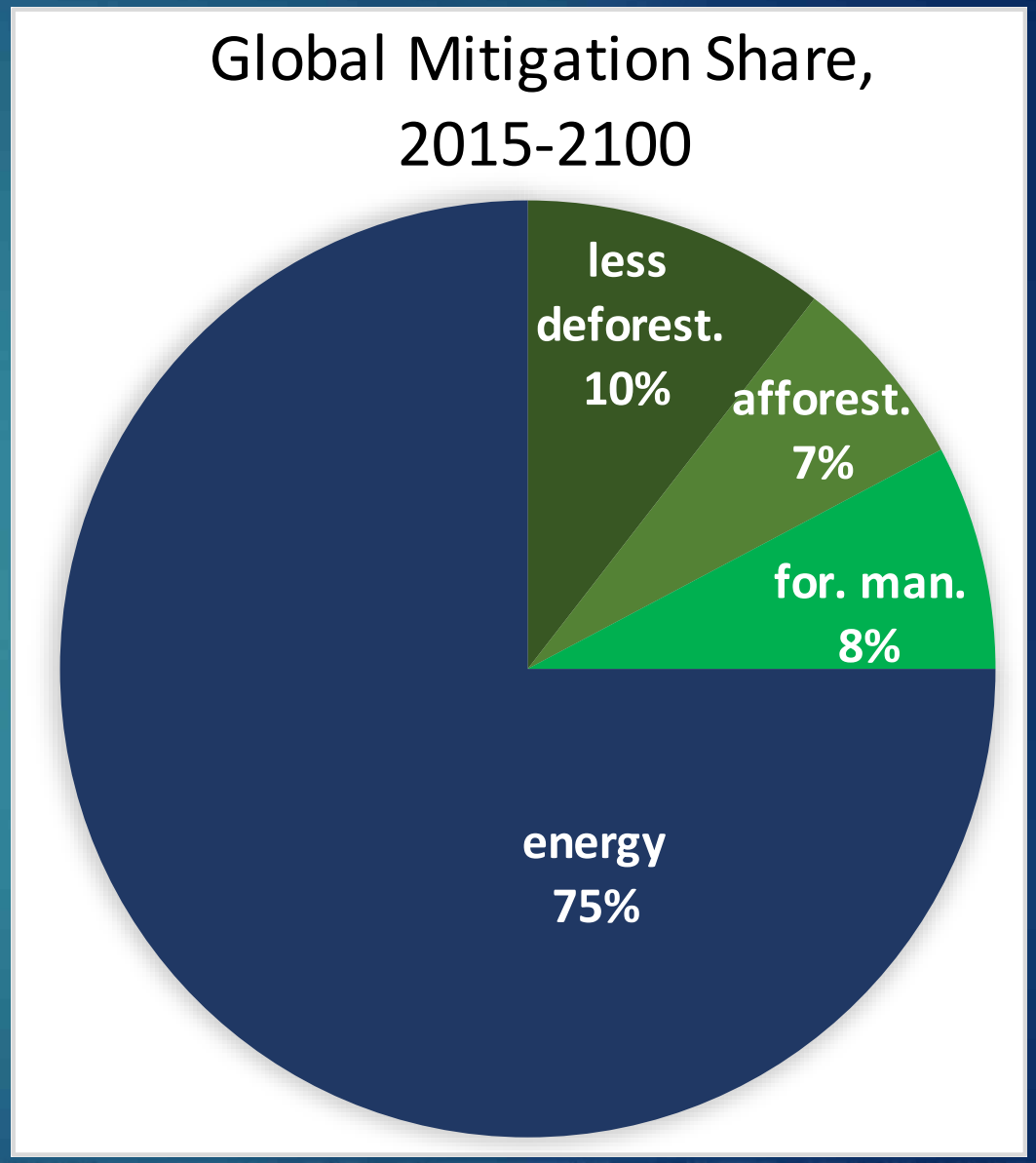
Potential Contribution of Forests to Climate Stabilization





Sources: IPCC (2014), Mendelsohn et al. (2012)

Large Forestry Emitters will need Mitigation Instruments

Country	Paris mitigiation pledge[a]	Objectives and measures for forestry	Percent of global CO_2 from deforestation, 2001-2013
Brazil	Reduce GHGs 37% below 2005 by 2025.	Zero illegal deforestation by 2030; restoring and reforesting 12 million hectares of forests by 2030	45.5
Indonesia	Reduce GHGs 29% (**41%**) below BAU in 2030 by 2030.	Ban on primary forest clearance; reduce deforestation/degradation; restire ecosystem functions; sustainable forest management.	9.0
Colombia	Reduce GHGs 20% (**30%**) below BAU by 2030.	Reduce deforestation; preserve important ecosystems.	3.4
Bolivia	Increase renewable energy share to 79% in 2030 (relative to 29% in 2010).	Zero illegal deforesation by 2020; increase forest coverage to 4.5 million hectares by 2030; increase sustainable forestyr management.	3.1
Madagascar	Reduce GHGs (**32%**) below BAU by 2030 with over half of reduction from forestry.	Reforestation for sustainable timber production and species conservation; reduction of forest timber extraction; agroforestry.	2.3
Peru	Reduce GHGs 20% (**30%**) below BAU in 2030 by 2030.	Measures to promote forest carbon storage not specified.	2.1
Mexico	Reduce GHGs 25% (**40%**) below BAU in 2030 by 2030.	Measures to promote forest carbon storage not specified.	2.0
Malaysia	Reduce GHG/GDP intensity 35% (**45%**) by 2030 relative to 2005.	Measures to promote forest carbon storage not specified.	1.9
Paraguay	Reduce GHGs 10% (**20%**) below BAU in 2030 by 2030.	Measures to promote forest carbon storage not specified.	1.7
Myanmar	Targets for renewables and energy efficiency.	Increase protected/reserved forest cover to 30% of land area through REDD+ related actions.	1.7
Ecuador	Reduce energy GHGs 20.4-25% (**37.5-45.8%**) below BAU in 2025.	Reforest 100,000 hectares per year to 2025.	1.5
Cambodia	Reduce GHGs (**10%**) below 2010 levels by 2030.	Increase forest coverage to 60% of land area by 2030.	1.5
Laos	Expand renewables; displace residential biomass buring through electricification.	Increase forest cover to 70% of land area by 2020	1.5

Source. UNFCCC.

Notes. [a]Where applicable, more ambitious targets condtional on external finance are in parentheses.

Sources: UNFCCC, WRI.

Promising Instrument for Carbon Storage: Feebates

- Sliding scale of fees/rebates for increases/decreases in carbon storage

  fee = {carbon $\text{storage}_{\text{base}}$ - carbon storage} · price/ton stored carbon

- Precedents
  - Low CO_2 vehicles (e.g., Den., Fr., Ger., Maur., Neth., Nor., Swe., UK)
  - Payment for ecosystem services (e.g., Costa Rica)

- Outline
  - Rationale; design issues; limitations

Rationale: Economic Considerations

- Effectiveness and cost-effectiveness
  - Promotes carbon storage across all responses/landowners
  - Equalizes incremental costs across responses/landowners
- Avoids leakage (for landowners within national borders)
- Avoids fiscal costs
  - Baselines can be chosen so revenues from fees ≈ rebate outlays
- Scaling up
  - Price can be aligned with emissions objectives

Rationale: Practical Considerations

- Administration
  - Capacity for monitoring carbon storage for 47 countries under REDD+
  - Finance ministry could apply fees/rebates using registry of landowners
- No need to assess additionality
  - Baseline available for measuring changes in storage
- Potential support from landowners receiving rebates

Project-by-Project Approaches

- Effectiveness/cost-effectiveness/scaling up constrained by
  - Administrative costs from contracting
  - No automatic mechanism for prioritizing cost-effective projects
  - Need for finance
- May cause leakage from landowners not covered by projects

Design Issues

- Setting baseline for revenue-neutrality
  - REDD+ reference adjusted for (national level) expected:
  - ✓Growth in BAU storage
  - ✓Proportionate increase in carbon storage from feebate
- Payment formulas
  - Ideally annual: carbon storage price = CO_2 price × interest rate
  - In contrast, up-front payments require complex repayments if storage not permanent

Effectiveness of Carbon Pricing

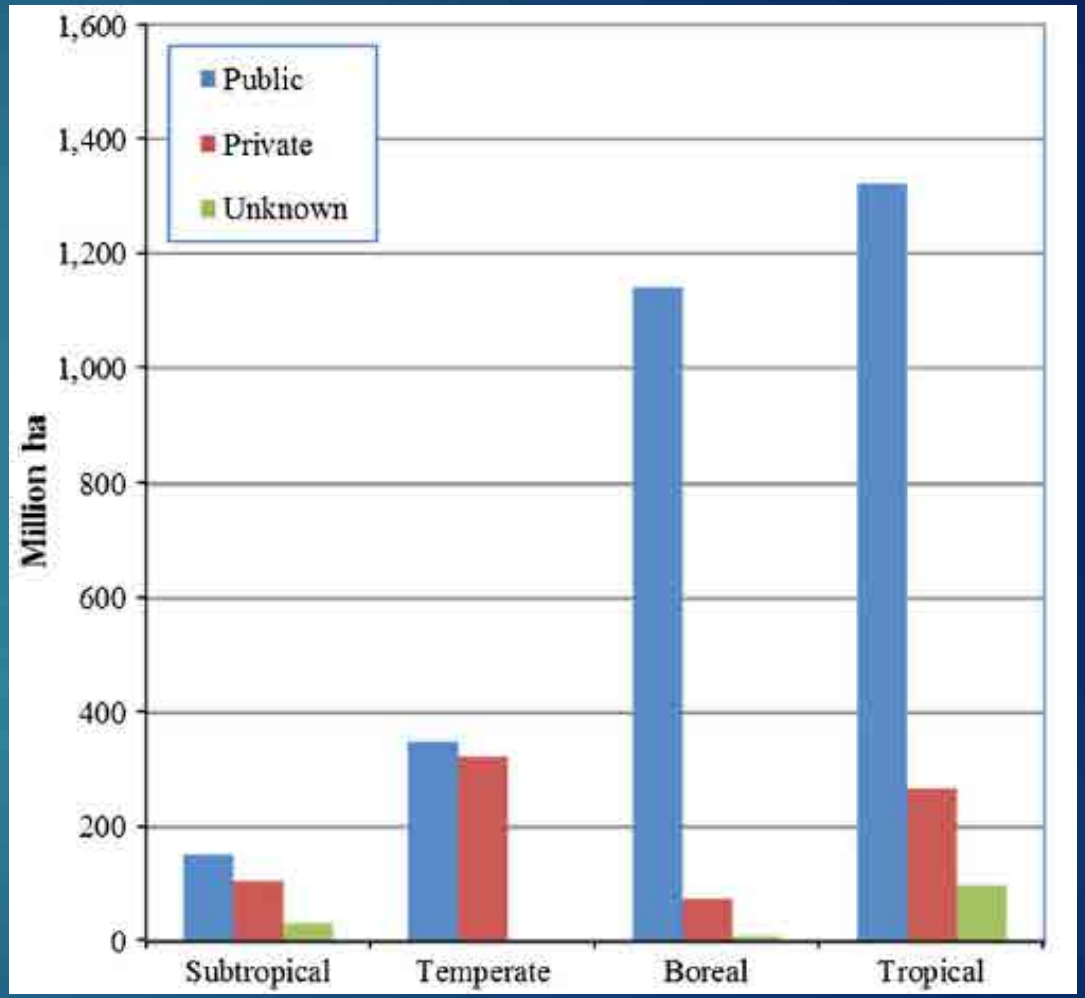
Region	Annual CO2 sequestered, bn tonnes, 2030 from CO2 price	
	$20/ton	$50/ton
Non-annex 1 East Asia	0.5	1.0
Transition countries	0.6	1.0
Central/South America	1.4	2.5
Africa	1.3	1.7
Other Asia	1.2	1.7
Total	4.9	8.0

Source: IPCC (2014).

Limitations: Land Ownership

- Most tropical forests publicly managed, but:
  - Marginal land (at agricultural border) most important
  - Forest ↔ farmland, tree plantations largely private
- Illegal logging, but:
  - Some NDCs (e.g., Brazil Bolivia) pledge to eliminate it

Forest area by ownership category, 2010



Source: Whiteman and others (2015).

Limitations: International Leakage

- Peer pressure may contain leakage (tracked through NDCs)
- Longer-term: international price floor for forestry emissions
  - Guarantees minimum effort, limits leakage
  - Met through feebate or other carbon pricing
  - Article 6.2 of Paris Agreement may help with participation/enforcement
  - May need to focus on effective carbon price if incomplete coverage