ENVIRONMENTAL DEFENSE FUND Finding the ways that work

Analyzing REDD and the Carbon Market: Overview

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Deforestation and Climate Change

- Tropical deforestation produces almost 20% of global annual greenhouse gas (GHG) emissions.
- Forest protection is time-limited near-term low-cost opportunity to reduce emissions and get on path to avoid 2°C warming.
- "Bridge to the future" of low carbon technologies.
- Biodiversity protection and other major environmental and social benefits.
- Other low-cost forest carbon opportunities.

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*R*educed *E*missions from *D*eforestation and Forest *D*egradation (REDD)

- Policy mechanisms to compensate tropical countries for reductions in forest carbon emissions.
- National-scale reductions below historical baseline levels is one promising approach.
- Bali action plan includes consideration of REDD.
- Little quantitative analysis to date.

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Policy Questions

- "Offsets" and "Cost Containment"
  - Compliance market for national-level REDD in amended version of U.S. Lieberman-Warner (S.2191) America's Climate Security Act
  - Senate debate started this week
- "Flooding the Market"
  - Concerns on incentives for low-carbon technologies

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Complimentary Models: Part I

- "Bottom-Up" Approach
  - Internal EDF Analysis (Pedro Piris-Cabezas, Nat Keohane)
  - Compilation of supply and demand curves from diverse other sources
  - Focus on Lieberman-Warner U.S. time tables and targets and policy architecture
  - Conservative assumptions about actions in rest of world

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EDF Carbon Market Analysis: Demand

- Demand for abatement: U.S. Environmental Protection (EPA) modelling assumptions
  - U.S. enacts Lieberman-Warner (70% reduction below 2005 by 2050 for 85% of national emissions)
  - Group 1 (EU, Japan, Canada, Australia, NZ), 60% below 1990 levels by 2050
  - Group 2, BAU until 2020, steady decrease to 1990 levels by 2050

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EDF Carbon Market Analysis: Supply

- Supply of Emission Reduction Credits
  - MIT EPPA Marginal Abatement Curves (MACs) for energy abatement in U.S.
  - Forest activity MACs from GTM EMF 21 (Brent Sohngen)
  - U.S. Environmental Protection Agency (EPA) MACs for all other domestic and international abatement options
- Policy framework
  - 10% CDM in Europe initially, none in US
  - Proposed U.S. limitations on use of domestic offsets and international credits

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Complimentary Models: Part II

- "Top-Down" Approach
  - Analysis with CCMC-FEEM (Anil Markandya, Valentina Bosetti, Massimo Tavoni)
  - Integrated assessment framework: WITCH model
  - Explicit modelling of R&D investments in energy sector and evolution of abatement costs over time
  - Global climate action is determined within model for chosen stabilization target
  - Brazilian Amazon deforestation cost curves from Woods Hole Research Center (Dan Nepstad, Frank Merry, IPAM)

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Forest Carbon Supply Curves

- EDF spreadsheet tool examines maximum global potential of crediting REDD and other forest carbon activities in global carbon market.
- Global forest carbon costs curves do not include institutional constraints, transaction and implementation costs, etc.
- Woods Hole opportunity cost curves for Brazil are detailed bottom-up assessment using spatially-explicit information.
  - To be conservative, assume full compensation of opportunity costs when integrating with WITCH.
  - REDD limited to one country but perhaps more "realistic" characterization of carbon market in near term.

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Two Models: Similar Preliminary Findings

- REDD credits lower global costs of meeting climate targets
- Significant near term opportunity and "bridge" to future energy technologies
- No market "flooding" --- Incentives remain for estimated deployment of low carbon technologies
  - 4-22% "maximum" carbon price decrease from REDD (EDF spreadsheet tool)
  - About 10% price decrease (WITCH model)