International Offsets: The potential role of the energy sector

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The Offset Dilemma

• Under Waxman-Markey bill, offsets of several stripes are admissible with a high limit on international crediting

• Abatement opportunities internationally are abundant and cheap, but many institutional barriers exist near-term

• In long-term, as support for global stabilization efforts broadens, non-OECD countries will become less willing to export cheap abatement options

• Is there a window of opportunity for offsets?
Sources of “Off-System” Compliance

- Domestic Non-CO$_2$ offsets
- Trading with other OECD
- Energy-related CO$_2$ offsets from non-OECD
- Non-CO$_2$ offsets from non-OECD (e.g. CDM)
- Afforestation / REDD offsets

MERGE
Integrated Assessment Model Analysis
OECD Potential Supply Curves for 2030

Non-CO₂ data are from USEPA Global Mitigation Report (2006).
Energy-related CO₂ data are MERGE model results.
Forestry CO₂ data are from Rose and Sohngen (2010),
Global Forest Carbon Sequestration and Climate Policy Design.

OECD ag-related non-CO₂

OECD required reductions

OECD required non-CO₂

Non-OECD energy-related CO₂

Global forestry CO₂

$/ton CO₂-e

billion tons CO₂-e reduction from BAU
Non-OECD energy-related CO$_2$ abatement

MERGE model results

Year = 2030

Russia

China

India

Mid-income

Low-income

$/ton CO$_2$

billion tons CO2 reduction from BAU
70% of abatement occurs in electric sector

MERGE model results

Single Largest Source

Russia
China
India
Mid-income
Low-income

Year = 2030

$/ton CO2
0 20 40 60 80 100 120 140 160 180

billion tons CO2 reduction from BAU
0 2 4 6 8 10 12 14

electric sector
other
Details of the Sectoral Mechanism

• Energy-related offsets must come from a capped sector in a participating country under a qualifying agreement.

• Cap must be below BAU; only reductions beyond the cap can be sold as offsets, market mechanisms are unclear.

• Originally conceived for internationally competitive industries (e.g. steel), but electric sector is by far the most important for generating offset trade volume.
Can a deal be negotiated?

- China by itself comprises half of non-OECD

- Would China accept an electric-sector cap linked to the US trading system? Or will it continue to pursue its own policy?

- Negotiation (with China or others) must balance host country’s political position on burden-sharing with potential financial benefits of offset trade
Host Country Economics of Crediting Baseline

- Host country MAC
- Costs incurred by host country
- Rents captured by host country
- International price
- Crediting Baseline
- Trade volume
China’s Electric Sector Emissions

Steel sector is currently ~10% of emissions, share likely to fall
+ Fewer options for abatement

In 2030, electric sector is half of total emissions (~40% now)

$/ton CO₂ in 2030

- $18
- $28
- $48
- $86
- $161

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China’s Electric Sector Emissions

Suppose an agreement is reached with China’s electric sector.

$/ton CO₂ in 2030
Offset Transfers from Non-OECD to OECD

International policy environment:

• 80% below 1990 by 2050 in OECD (USA + EU + Japan + CANZ)

• W-M scale offset provisions in all OECD countries

• Expanding CDM for non-CO₂ offsets from non-OECD

• Energy offsets from capped Chinese electric sector only
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- Full potential for global forestry
Compliance in OECD with Cap on China Elec.
Compliance in OECD with Full Forestry

USA

Other OECD

Billion tons CO$_2$-e

Domestic Non-CO$_2$ offsets
Imported credits
Reductions

BAU

CAP

1990 2000 2010 2020 2030 2040 2050
1990 2000 2010 2020 2030 2040 2050

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US Permit Prices with OECD-only Targets

- No international offsets
- Non-CO$_2$ + China’s electric sector
- International offset price
- Non-CO$_2$ + China’s electric sector + full forestry
- International offset price
Impact of Longer Term Global Targets

• To achieve commonly discussed stabilization targets, all major developing countries must participate.

• Currently, targets are “aspirational” only, but they could become a reality in the future.

• Consider G8 leaders’ goal for an emissions path to 2050 consistent with a 2°C temperature target.

50% global reduction below 2000 levels +
80% below for OECD ↘
20% below for non-OECD
Baseline Emissions for Non-OECD
20% below 2000 = 80% below BAU in 2050
In G8 scenario, trade flows the other direction

Result holds even with a BAU allocation to non-OECD through 2030
US Permit Price in G8 Scenario

No BAU allocation to non-OECD

BAU allocation through 2020

through 2030

Range with OECD-only targets

2008 $ per ton CO₂-e

2020 2030 2040 2050
Conclusions

• Energy-related offsets depend on sectoral deals; supply is maximized by loose caps on electric sectors in large countries

• Political economy behind such agreements is complex, could take several years to negotiate

• Even with a successful negotiation, mechanism for selling excess reductions to US compliance parties is not clear

• Ultimately, sectoral caps may be abandoned in favor of national targets as countries join stabilization effort